SONY

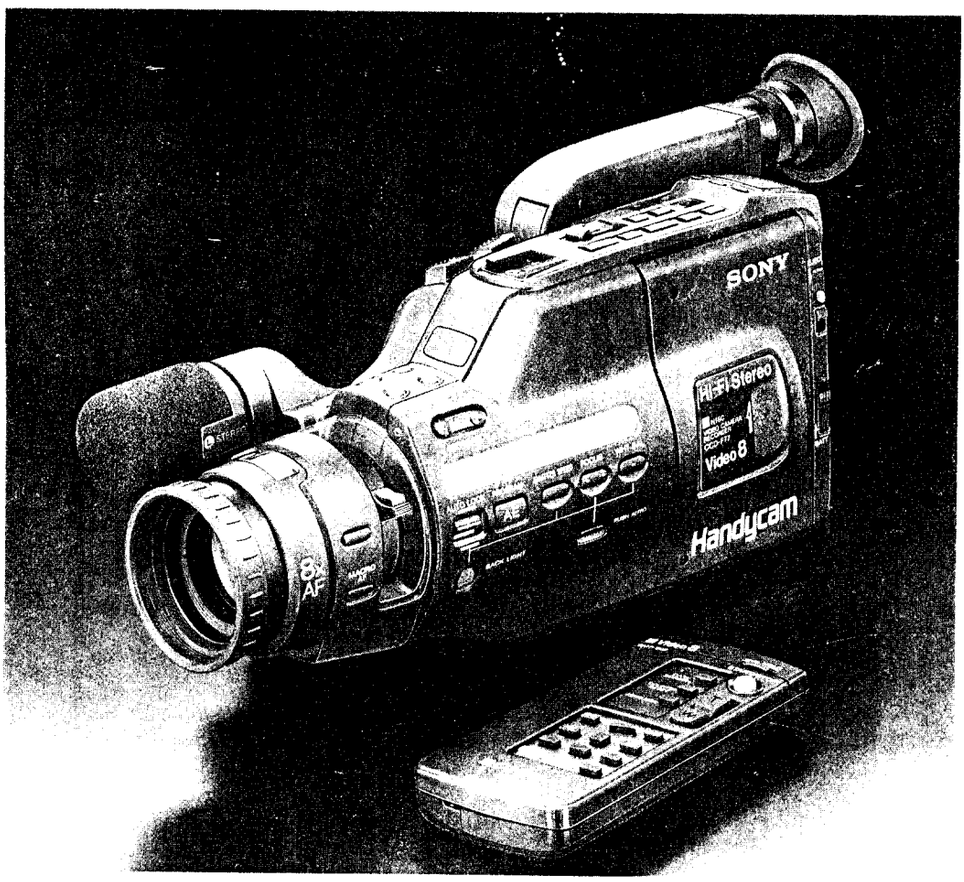
3-751-687-21 (1)

Video Camera Recorder 8

CCD-F77

Operating Instructions

Before operating the unit, please read this manual thoroughly and retain it for future reference.



Video 8 Handycam

1996 by Sony Corporation

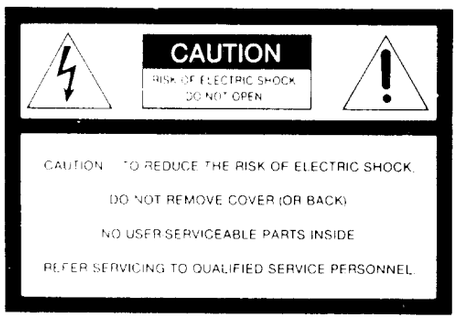
Owner's Record

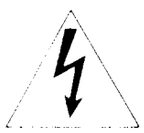
The model and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. CCD-F77 Serial No._____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Information for the customers in the U.S.A.

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move the equipment away from the receiver
Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

Notice for the customers in Canada

This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

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Introduction

Overview of the CCD-F77

The CCD-F77 Video 8 Handycam is a compact color video camera/recorder (camcorder). You can use it to shoot the pictures you want and play them back on your television set. The camcorder works with 8mm video format cassettes.

Who this Manual is for

This manual is designed for you. You can use this manual to find exactly the information you need, whether you are familiar with video equipment or not.

How the Manual is Organized

The first section of the manual explains the preliminary steps necessary to prepare for shooting and playing back.

Other sections include shooting procedures that show you how to use the features and functions of your camcorder. If you are a beginner, start with "Recording with automatic adjustments". If you are very familiar with the camcorder, try to shoot your picture with manual adjustments as well as automatic adjustments.
If you want to record right away, see p. 12, 19 through 23.

The manual also includes how to play back a picture on a TV and how to edit your original 8mm tape onto another video tape, and how to record a picture from another video tape or TV.

If you have any problems during operation, see the "Trouble check" section.

How this Manual Works

Use the information below to help you follow the instructions in this manual.

- Controls and settings on the camcorder are shown in capital letters:
  ex. **Set POWER to CAMERA.**
- The letter in an illustration corresponds to the letter in the text:
  ex. **(A-1) or [a]**
- The step numbers in an illustration correspond to the step numbers in the text.
- Notes and cautions are enclosed with lines.
  ex.

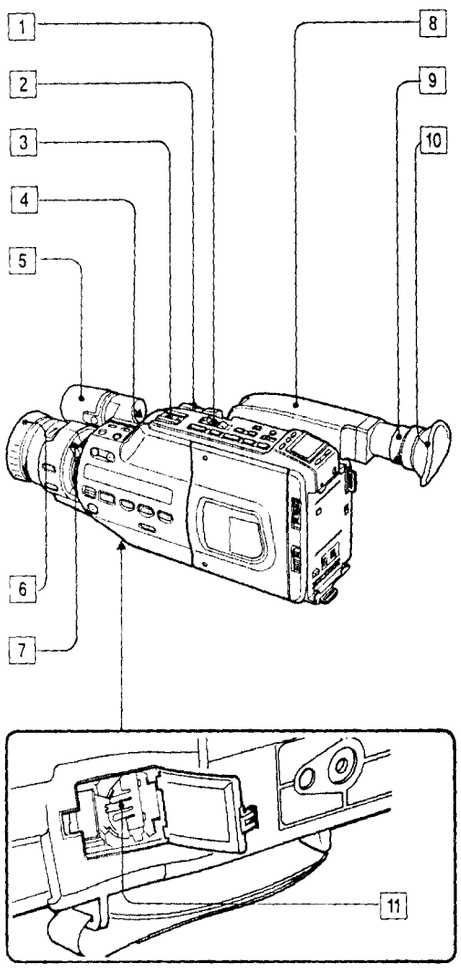
Note on battery life
Battery will not last as long in cold places.

Supplied accessories

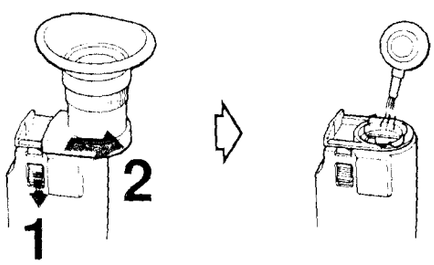
The camcorder is packed with the following units. Check to see that everything is contained in the package. (*Attached to the camcorder.)

- Wireless Remote Commander (1)
- Size AA (R6) battery for Remote Commander (2)
- Battery pack NP-66H (1)
- AC Power adaptor AC-V65 (1)
- Lithium battery CR2025 (1)
- RFU adaptor RFU-90UC (1)
- A/V connecting cord (1)
- Shoulder strap (1)
- Lens cap (1)*

(A-1)



(A-2)



For details on the use of each part, refer to the pages indicated in the circle.

(A-1)

1 **Power switch**
CAMERA: for camera recording
VTR: for playing back or editing tapes
OFF: power off

2 **Power zoom button** ㊴ ㊵

3 **Accessory shoe**
Attach a video light, external microphone, etc. (not supplied).

4 **Remote control sensor** ⑪

5 **Built-in microphone (stereo)**

6 **Lens hood/focus ring** ㉒

7 **Zoom lever** ㉝ ㊴ ㊵

8 **Viewfinder**
The picture being recorded or played back can be monitored in black and white in here. Also, marks such as caution indicators and function mode appear in here.

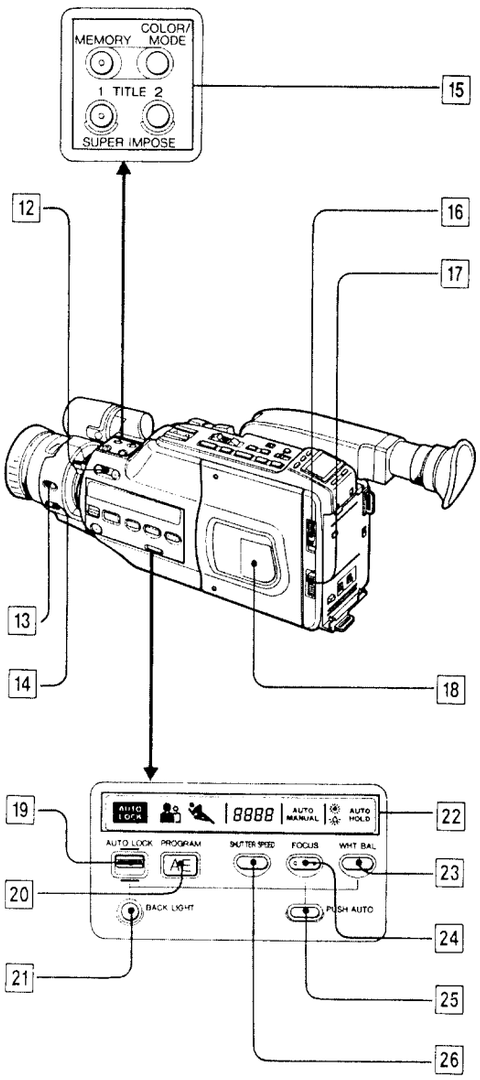
9 **Viewfinder lens adjustment ring** ㉒

10 **Eyecup**

11 **Lithium battery compartment** ⑲

To remove dust from inside the viewfinder
Detach the eyecup as illustrated and clean the surface of the screen with a blower. (A-2)

(A-3)



(A-3)

12 EDITSEARCH (and recording review) buttons 25 26 27 28

13 FADER button 42

14 MACRO AF (macro autofocus) button 40

15 SUPERIMPOSE buttons 43
TITLE 1 button
TITLE 2 button
MEMORY button
COLOR/MODE button

16 EJECT (cassette eject) knob 21

17 BATT (battery eject) knob 13

18 Cassette holder

19 AUTO LOCK switch 23
When you record with automatic adjustment, set to the green position.

20 PROGRAM AE (program auto exposure) button 30

21 BACK LIGHT button 38

22 Display window 29

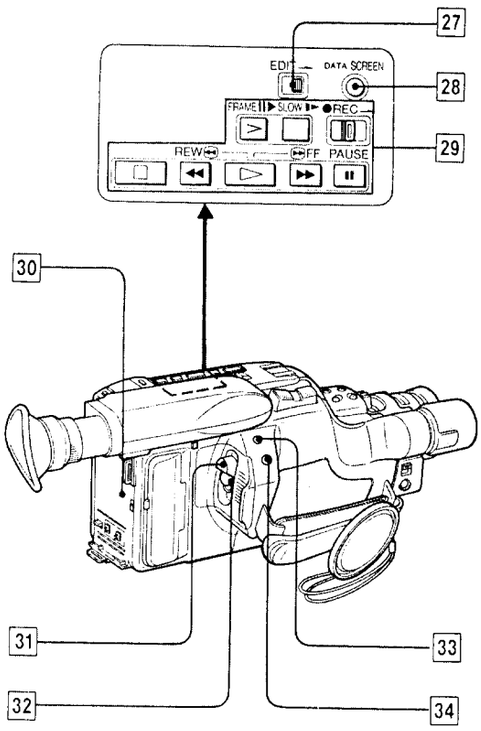
23 WHT BAL (white balance) button 35

24 FOCUS button 33

25 PUSH AUTO button 33

26 SHUTTER SPEED button 37

(A-4)



(A-4)

27 **EDIT switch** (55)

28 **DATA SCREEN button** (52)

29 **Tape transport buttons** (52) (53)

- ▷ (playback)
- ▶▶ (fast forward)
- ◀◀ (rewind)
- □ (stop)
- II (pause)
- ▷/II▶ (forward direction/frame-by-frame in forward direction)
- I▶ (slow playback)

30 **Battery mounting surface** (13)

31 **STANDBY switch**
Slide up to set the camcorder to standby mode.

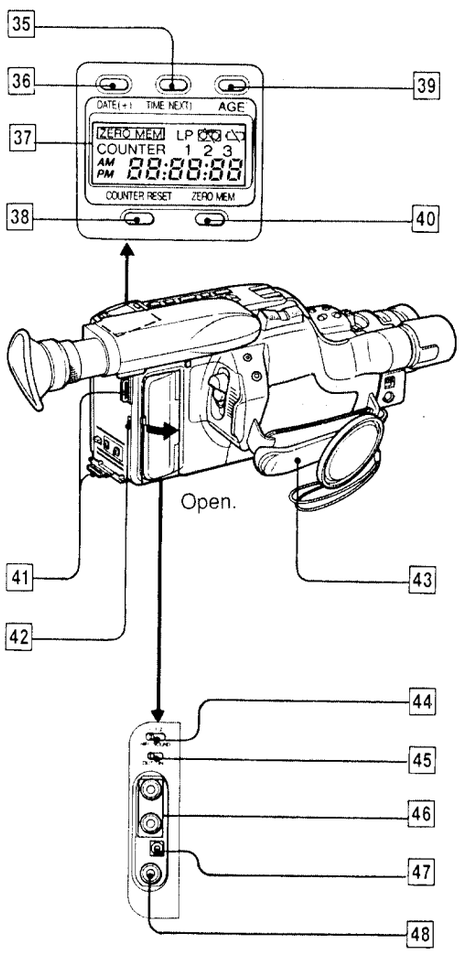
32 **START/STOP button**
Press to start and stop camera recording.

33 **REMOTE control connector (stereo mini-minijack)**
Connect a wired remote control unit or editing controller, etc. here.

34 **(headphones) jack (stereo minijack)**

About (LANC)
stands for Local Application Control Bus System. The connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

(A-5)



(A-5)

35 TIME (NEXT) button ⓴ ㉕ ㊼

36 DATE (+) button ⓴ ㉕ ㊼

37 Display window

38 COUNTER RESET button ㊼ ㊽

39 AGE button ㊼

40 ZERO MEM (memory) button ㊼ ㊽

41 Hooks for shoulder strap

42 R REMOTE COMMANDER ON/OFF switch ⓾

43 Grip belt

44 HiFi SOUND selector ㊿ ㊶ ㊹

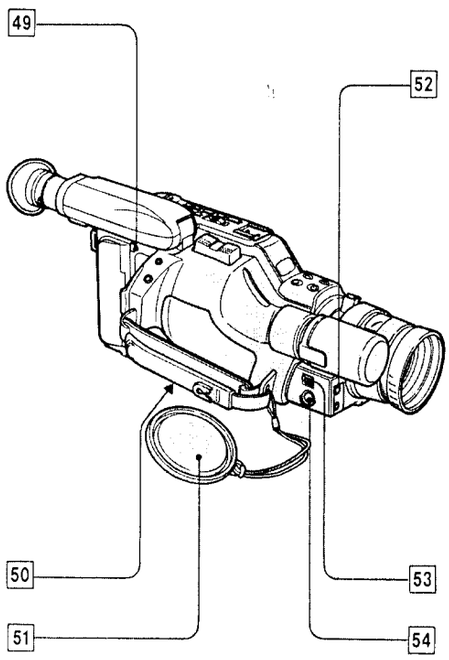
45 IN/OUT (video and audio input/output) selector ㊿ ㊻

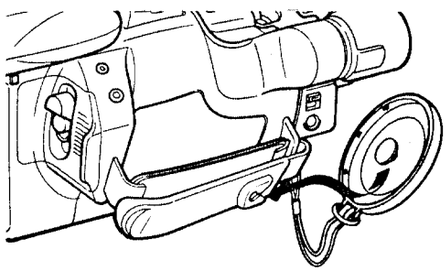
46 AUDIO L/R input/output jacks (phono jacks) ㊻

47 RFU DC OUT (RFU adaptor DC output) jack (special minijack)
Attach the supplied RFU adaptor here.

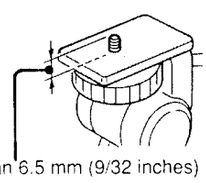
48 VIDEO input/output jack (phono jack) ㊻

(A-6)





(A-7)



Less than 6.5 mm (9/32 inches)

(A-7)

49 **PUSH SLIDE (viewfinder positioning) button** ㉓
Use this button to move the viewfinder to the comfortable position to use.

50 **Tripod receptacle (bottom)**

51 **Lens cap**

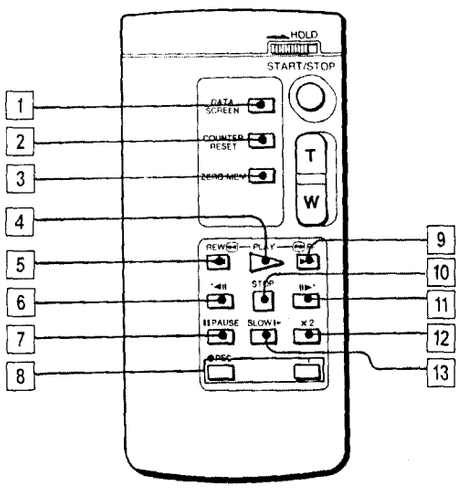
52 **MIC (microphone) jack (stereo minijack) and DC OUT (power output) jack (mini-minijack)**
Connect an external stereo microphone (not supplied) to record in stereo, or monaural microphone (not supplied).
The MIC jack accepts Sony "plug-in-power" microphone and the DC OUT jack supplies power to it.

53 **BUILT IN MIC (microphone) switch** ㉕
Set to "WIND" when recording in a strong wind.

54 **REC (recording) START/STOP button (for low-position recording)**
Use this button instead of the START/STOP button for easier low-position recording.

Note when attaching a tripod not manufactured by Sony (A-7)
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm.
Otherwise the screw may damage the inner parts of the camera.

(A-8)



Wireless Remote Commander

You can record or play back a tape from a distance.
The buttons on the Commander with the same name or mark as those on the camcorder have the same function.

When you use the Commander
Be sure to set the REMOTE COMMANDER ON/OFF switch on the camcorder to "ON", and then start operation of the camcorder, with the Commander pointing towards the remote sensor. (See page 11.)

(A-8)

Note
The * indicates the functions which are operable only with the Commander.

[1] DATA SCREEN button

[2] COUNTER RESET button

[3] ZERO MEM (memory) button

[4] ▷ PLAY (playback) button 52

[5] ◀◀ REW (rewind) button 52

[6] < /◀II (reverse direction/reverse frame) button* 53

[7] II PAUSE button 52

[8] Recording buttons
Press the buttons simultaneously when recording from another equipment.

[9] ▶▶ FF (fast forward) button 52

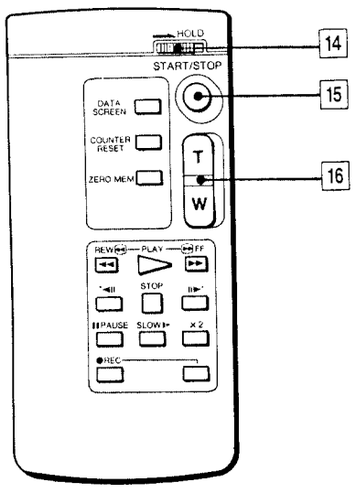
[10] □ STOP button

[11] > /II▶ (forward direction/forward frame) button 53

[12] x 2 (double speed playback) button* 53

[13] SLOW ▮▶ (slow playback) button 53

(A-9)



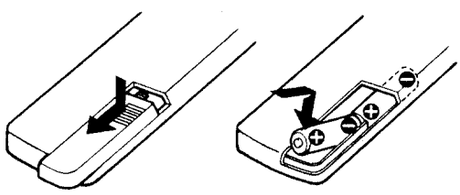
(A-9)

14 **HOLD switch**
Slide in the direction of the arrow to prevent the buttons from being accidentally pressed.

15 **START/STOP button**
Press to start and stop camera recording.

16 **Power zoom button**

(A-10)

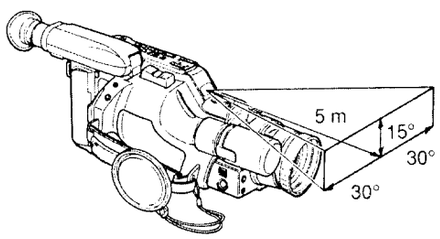


Installing batteries
(A-10)
Insert two size AA (R6) batteries with correct polarity.

Battery life
In normal operation, batteries will last up to half a year. If the unit does not operate properly, the batteries might be exhausted. Replace both with new ones.

To avoid damage from possible battery leakage
Remove the batteries when the Commander will not be used for a long time.

(A-11)



Operating range
(A-11)
Point the Commander to the remote sensor. The Commander can be used within the range as illustrated.

Connecting the Power Sources

First, Choose the Power Source

Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-66H (supplied), NP-77H, NP-77 or NP-55
	Alkaline batteries	Battery case EBP-55
Indoors	House current	AC power adaptor AC-V65 (supplied), AC-V30, AC-V35 or AC-V55
In the car	12 V or 24 V car battery	DC pack DCP-55, or AC power adaptor AC-V55 and car battery cord DCC-16AW

Notes on power sources

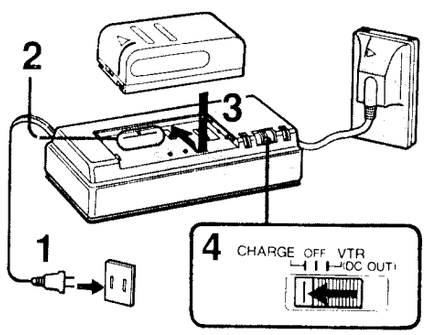
Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. In this case, supply the power again immediately.

Using the Battery Pack

Step 1

Charge the battery pack. (B-1)

(B-1)



1 Connect the AC power adaptor to a wall outlet.

2 Align the right side of the battery pack with the line on the AC power adaptor.

3 Slide in the battery pack in the direction of the arrow.

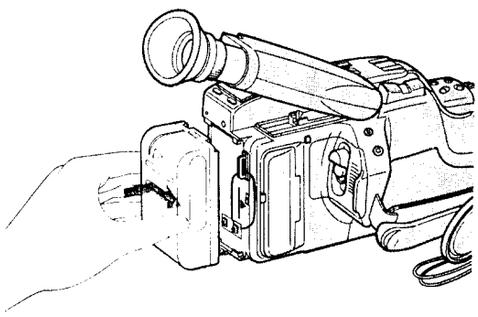
4 Set the CHARGE/VTR selector to CHARGE.

	NP-66H	NP-77H	NP-77	NP-55
Required charging time	100	140	120	60

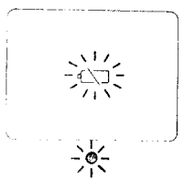
(approx. minutes using AC-V65)

See the instruction manual of the AC power adaptor for details.

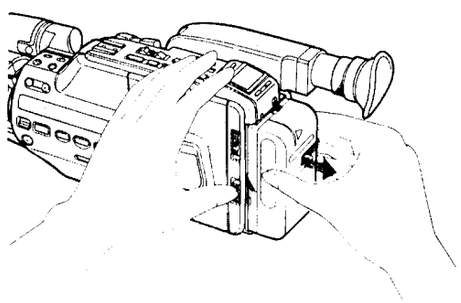
(B-2)



(B-3)



(B-4)



Step 2

Mount the battery pack on the camcorder. (B-2)

1 **Align the right side of the battery pack with the line on the camcorder.**

2 **Slide in the battery pack to the right.**
Note: Make sure the battery fits completely on the mounting surface of the camcorder. Imperfect fit may damage the projections on the camcorder.

Battery life
A fully charged battery pack lasts for:

	NP-66H (supplied)	NP-77H	NP-77	NP-55
Battery life	80	110	90	45

(approx. minutes, continuous recording when used indoors)

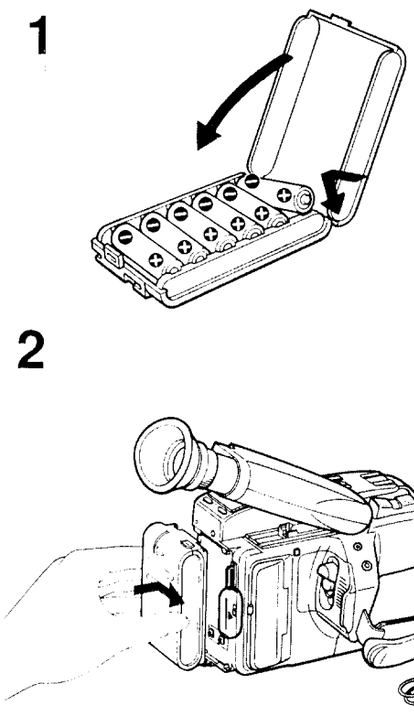
When the battery becomes weak, the ⌧ indication and red lamp blink in the viewfinder. **(B-3)**
Replace the battery pack with a fully charged one.

To remove the battery pack (B-4)
Slide BATT up, and at the same time, slide out the battery pack to the left.

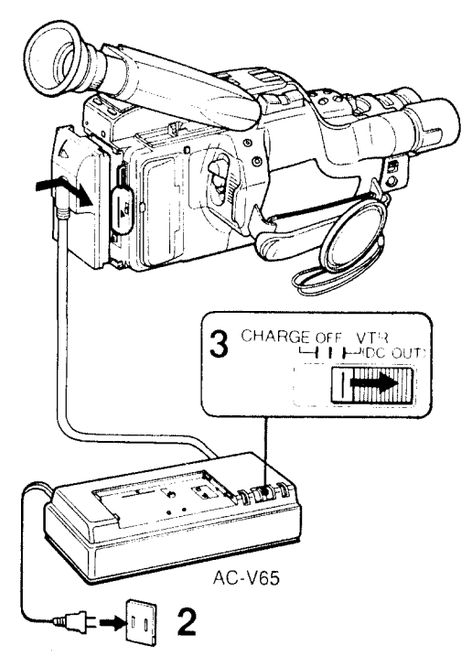
Other options for charging
- AC-V55 AC power adaptor:
  You can charge two battery packs continuously.
- BC-55, BC-77 portable battery charger:
  You can charge a battery pack on 100 – 240 V AC.
- DC-V30 car battery charger:
  You can charge a battery pack by connecting the car battery charger to the cigarette lighter socket.

If you have an NP-4000
You can use it for long outdoor recording.
The DCP-55 DC pack is required for the connection (not supplied.)

(B-5)



(B-6)



Using Alkaline Batteries

(B-5)
The EBP-55 battery case is required (not supplied).

1 **Insert the six size AA (R6) alkaline batteries into the battery case.**

2 **Attach the case in the same way as the battery pack.**

Battery life
Approx. 40 minutes
(continuous recording when used indoors)

To remove the battery case
Proceed in the same way as the battery pack.
See page 13.

Notes on battery life
- Batteries will not last as long in cold places.
- No indication appears in the viewfinder to warn of a weak battery.

Using House Current

(B-6)
The supplied AC-V65 AC power adaptor is required.

1 **Align the right side of the connecting plate with the line on the camcorder, and slide it in to the right.**

2 **Connect the AC power adaptor to a wall outlet.**

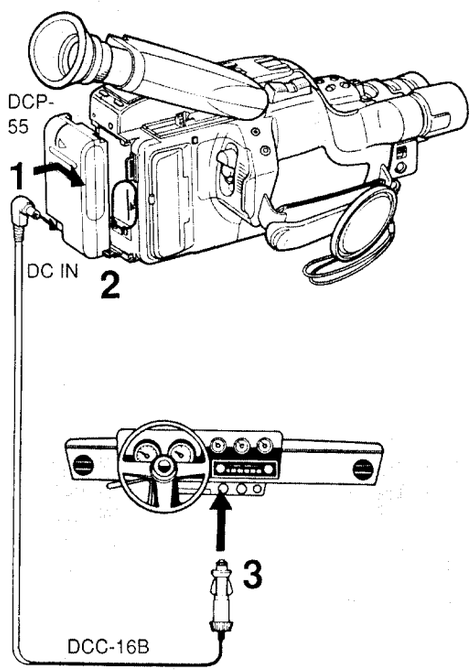
3 **Set the CHARGE/VTR selector of the AC power adaptor to VTR (DC OUT).**

See the instruction manual of the AC power adaptor for details.

To remove the connecting plate
Proceed in the same way as the battery pack.
See page 13.

Other option
The AC-V55 AC power adaptor can also be used.

(B-7)



Using Car Battery

(B-7)

The DCP-55 DC pack is required (not supplied).

1 **Insert the DCC-16B car battery cord supplied with the DCP-55 DC pack into the DC IN jack on the DC pack.**

2 **Align the right side of the DC pack with the line on the camcorder, and slide it in to the right.**

3 **Connect the DCC-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).**

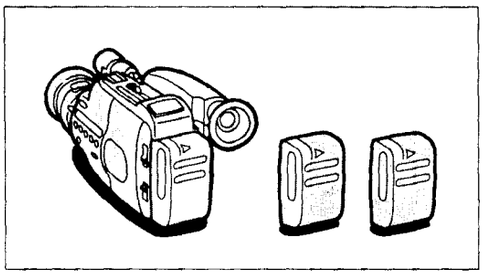
To remove the DC pack

Proceed in the same way as the battery pack.
See page 13.

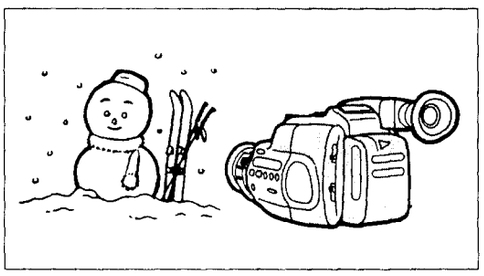
Other options

The AC-V55 AC power adaptor and the DCC-16AW car battery cord can also be used to operate this camcorder on a 12 V or 24 V car battery.

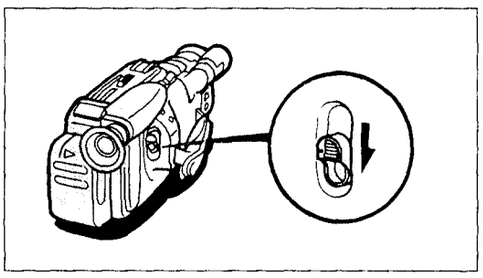
(C-1)



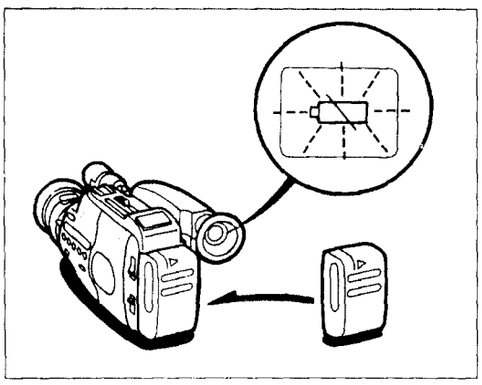
(C-2)



(C-3)



(C-4)



How to Prepare the Rechargeable Battery Pack

Have sufficient battery pack power to do 2 or 3 times as much recording than you have planned. (C-1)
"Battery life" as indicated in the instruction manual or catalogue of the camcorder is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.

Battery life is shorter in a cold climate. (C-2)
Battery efficiency is decreased and the battery will be used up more quickly.

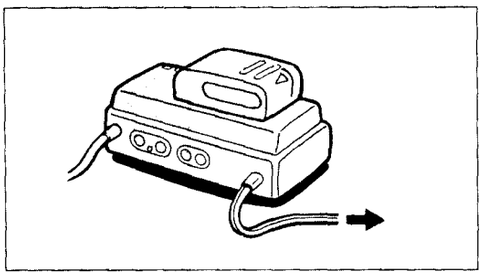
Turn the STANDBY switch of the camcorder off when not recording to save battery power. A smooth recording can be made even if recording is stopped and started again. (C-3)
While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

When the Rechargeable Battery Pack should be Replaced

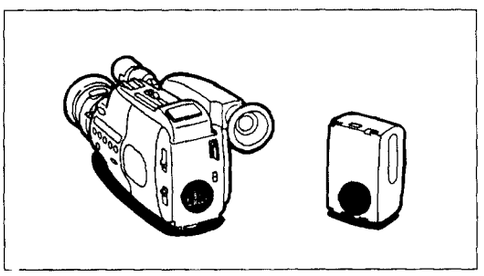
When the ⌂ mark in the viewfinder changes from slow blinking to rapid blinking while you are recording. (C-4)
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.

Using the Best of Battery Pack

(C-5)



(C-6)



Notes on Charging

Before using the battery pack, charge it sufficiently. A brand new battery pack is not charged.

Recharge the battery pack only when it is exhausted. (C-5)

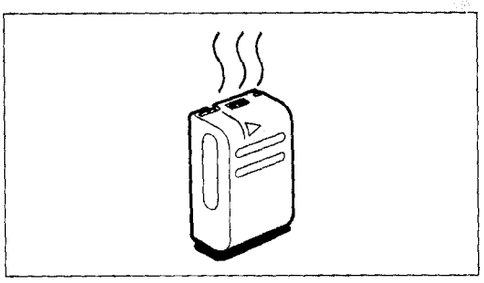
- If recording is completed before the ⏍ mark appears in the viewfinder, it is recommended that you remove the tape, set POWER to CAMERA, slide up STANDBY, and leave the camcorder until the ⏍ mark blinks rapidly.
- Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you fully discharge and charge the battery again.

Recharge the battery pack before using.
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.
Charge it again but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

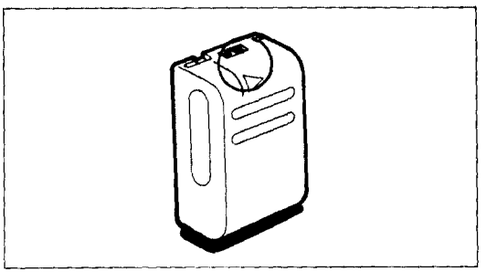
Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened. (C-6)
When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

(C-7)



(C-8)



Notes on the Rechargeable Battery Pack

Why the battery pack heats up (C-7)
During charging or recording, the battery pack heats up. This means energy has been generated and chemical change has occurred inside the battery pack and this is not dangerous.

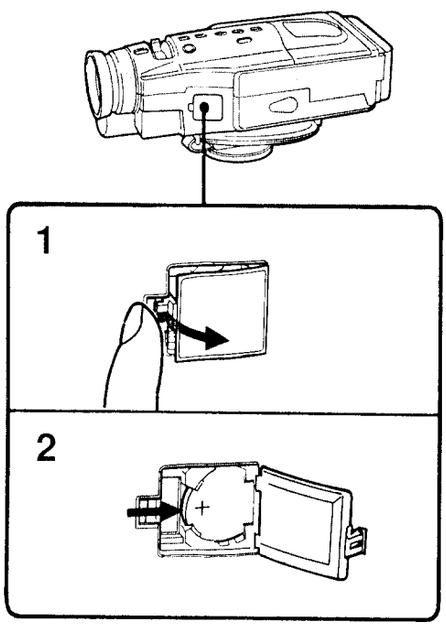
How to care for the battery pack
- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is in the camcorder, a small amount of current flows to the camcorder even if the POWER switch is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus, it is recommended you charge the battery before using.

How to use the switch on the battery pack (C-8)
This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

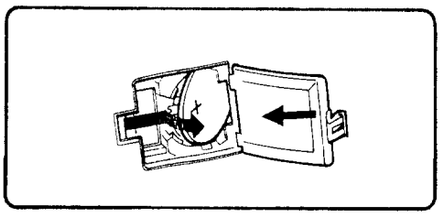
How many times can the battery pack be recharged
It can be fully charged and discharged about 500 times under normal temperatures.
If the ⌧ mark blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Temperatures during charging
Lower temperatures require a longer charging time. Charging under temperatures ranging from 10°C to 30°C (5°F to 85°F) is recommended.

(D-1)



(D-2)



Inserting the Lithium Battery

(D-1)

This camcorder uses a lithium battery to activate the clock and to keep titles and birth dates in memory. Before operating it for the first time, install the supplied lithium battery.

Attach the power source before installing the lithium battery.

1 **Open the cover of the lithium battery compartment on the bottom.**

2 **Install the supplied CR2025 lithium battery with the + side facing out.**

3 **Close the cover.**

To remove the lithium battery (D-2)

Press the side of the battery in the direction as indicated for installation.

Note on lithium battery life

The battery will last for approximately 1 year in normal operation.

When the lithium battery becomes weak, the time indication will blink on the viewfinder screen for about 5 seconds (when POWER is set to CAMERA). In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.**

After replacing the battery, readjust the date, time and titles, birth dates. (If the battery is replaced while the battery pack is attached, the readjustments are not necessary.)

Cautions

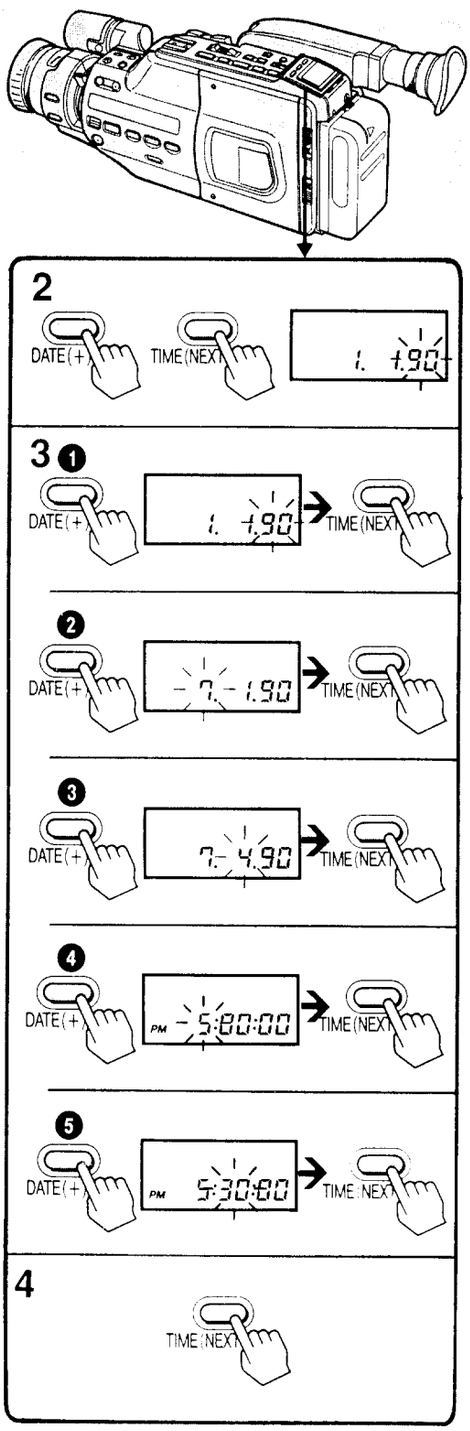
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.

WARNING

Battery may explode if mistreated.
Do not recharge, disassemble or dispose of it in fire.

(continued)

(D-3)



Setting the Date and Time

(D-3)

1 **Make sure that a power source is connected, set POWER to CAMERA, and slide STANDBY up.**

2 **Press DATE and TIME simultaneously for more than 3 seconds until the date indication appears in the display window.**
DATE now functions as + (to advance numbers) and TIME functions as NEXT (to execute).

3 **Adjust the year, month, day, hour and minute, in that order.**
First adjust the blinking digits with +, and then press NEXT.
The year starts from 1990 and proceed as follows.

90 (1990) → 91 → - - - - - → 00 (2000)
↑ ↓
20 (2020) ← - - - - - - - - - ← 01 (2001)

4 **Press NEXT to set the second to "00".**
The clock starts operating.

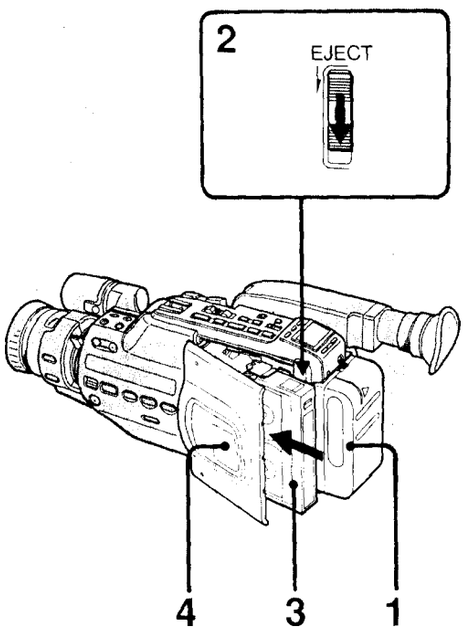
To correct date and time setting
Repeat steps 2 to 4.

To advance the digits faster
Keep + pressed.

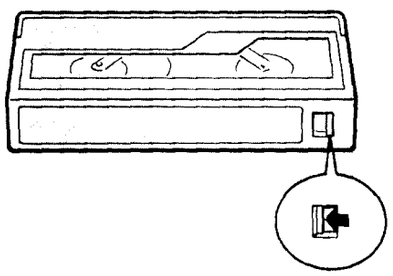
To check the preset date and time
Press DATE or TIME. When you press the same button again, the indication goes off.

Inserting Tapes

(E-1)



(E-2)



Inserting a Tape

(E-1)

1 **Make sure a power source is connected.**

2 **While pressing the small button, slide EJECT.**

3 **Insert a tape with the window facing outside.**

4 **Press the PUSH mark to close the cassette holder.**

Ejecting the Tape

1 Make sure that a power source is connected.
2 While pressing the small button, slide EJECT.
3 Take out the tape and press the PUSH mark to close the cassette holder.

Preventing Accidental Erasure

(E-2)

Slide out the red tab on the cassette to prevent recording.

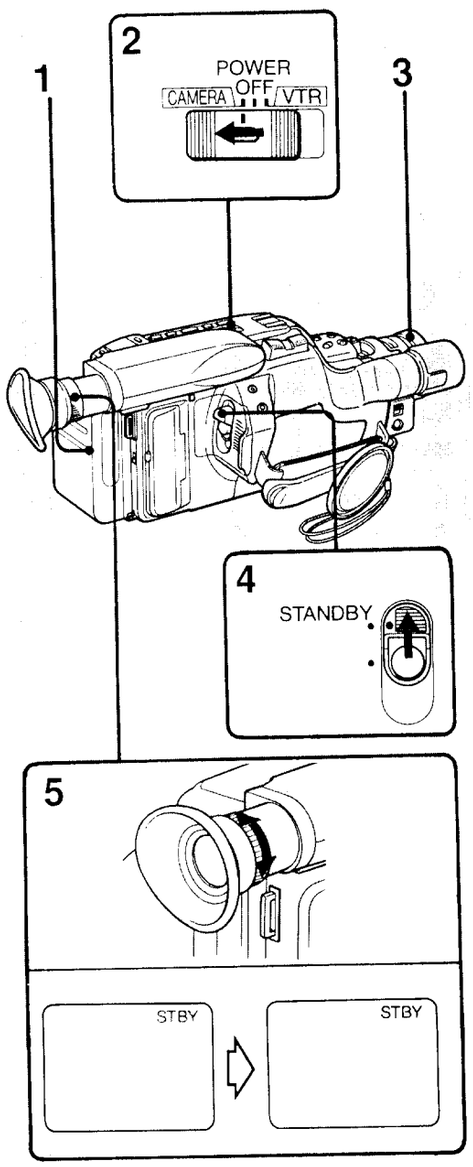
To re-record on this tape, slide the tab back in.

Notes on handling tapes

- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type and thickness of tape, or if the tab is out or in, etc.
- Store tapes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding .

Adjusting the Viewfinder Lens

(F)



The position of the viewfinder lens for optimum vision varies depending on the person. Adjust when using for the first time, or when using after someone else. (F)

1 Make sure a power source is connected.

2 While pressing the green button, set POWER to CAMERA.

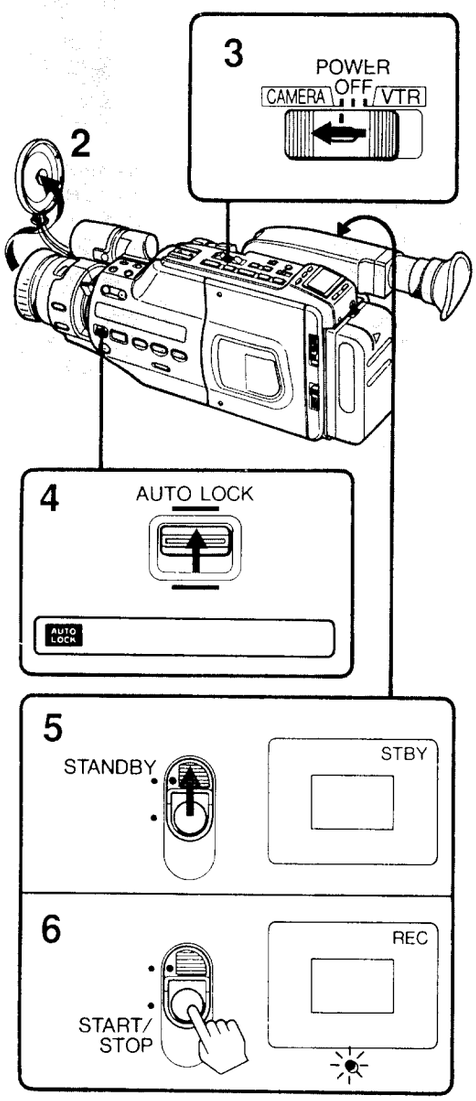
3 Insert a cassette.

4 Slide STANDBY up.

5 Turn the viewfinder lens adjustment ring so that the "STBY" displayed in the viewfinder screen comes into sharp focus.

Recording a Picture Using Automatic Adjustments

(G-1)



Caution
Before recording "once-only" events, we strongly recommend making a trial recording and checking that everything is working perfectly.

Start Recording

(G-1)

1 **Hold the camcorder as in the figure. (G-2)**
(Put your hand through the grip belt and make sure that your finger can easily touch START/STOP.)
If your nose touches the camcorder, press PUSH SLIDE to adjust the position and angle of the viewfinder.

2 **Remove the lens cap and attach it to the grip belt.**

3 **While pressing the green button, set POWER to CAMERA.**

4 **Set AUTO LOCK to the green position.**
AUTO LOCK appears in the display window.

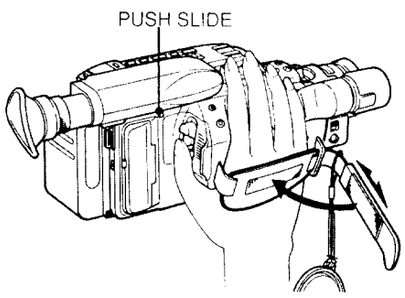
5 **Slide STANBY up.**
"STBY" appears in the viewfinder. The camcorder is now in standby mode.
Focus is adjusted automatically. Do not turn or stop the focus ring forcibly.

6 **Press START/STOP.**
"REC" appears in the viewfinder. The camcorder is now recording.

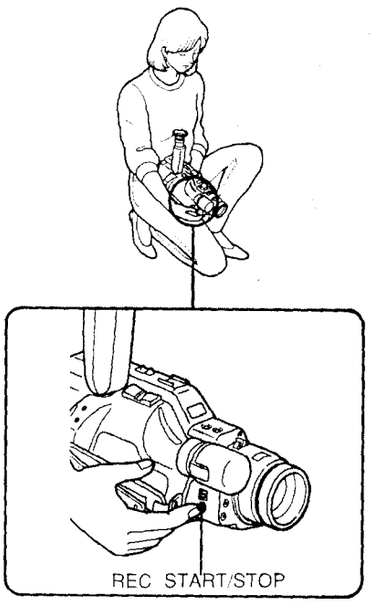
To stop momentarily
Press START/STOP again.
"STBY" appears in the viewfinder. The camcorder is in standby mode again.

To stop
Slide STANDBY down and set POWER to OFF.

(G-2)



(G-3)



For low-position recording (G-3)

The viewfinder can be turned 90 degrees up. Press the REC START/STOP button in front of the camcorder.

To stop recording, press it again.

Notes on recording

- To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- If POWER is moved during recording, the tape will stop.
- When moving from indoors to outdoors, or vice versa, slide STANDBY up and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.

Note on standby mode

If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume standby mode, slide STANDBY down once and slide it up again. To start recording, press REC START/STOP directly.

Note on light sources

If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to the other direction.

Recording mode

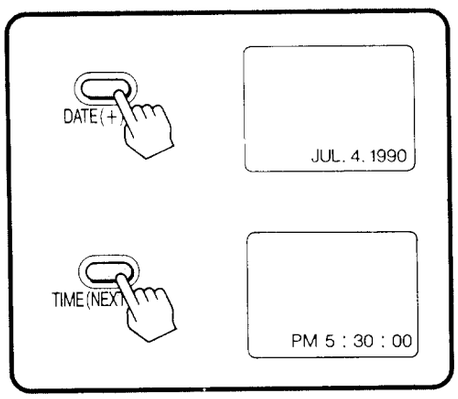
This unit records in the SP mode (approximately 1.43 cm/second) and can play back in the SP mode and the LP mode (approximately 0.72 cm/second). The quality of the playback picture in the LP mode, however, will not be as good as that in the SP mode.

Notes on PCM recording and playback

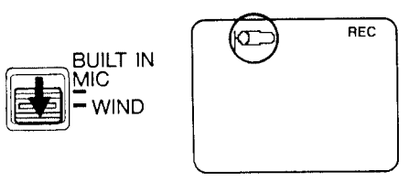
PCM recording or playback is not possible with this unit.

The PCM sound recorded or after-recorded with another video recorder cannot be played back with this unit.

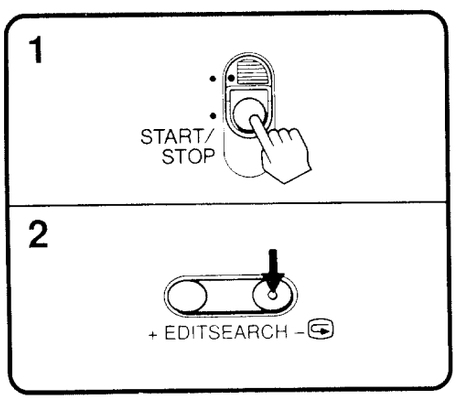
(G-4)



(G-5)



(G-6)



Recording the Date or Time

(G-4)

During camera recording or when in standby mode, press DATE for date indication or TIME for time indication.
The date or time displayed in the viewfinder is recorded with the picture.

To stop recording date or time
Press DATE or TIME again.
The picture recording continues.

When there is a Strong Wind

(G-5)
Set BUILT IN MIC to WIND. The effects of noise from the wind will be reduced.
After recording, return it to the green position.

To Check the Last Portion of the Previous Recording

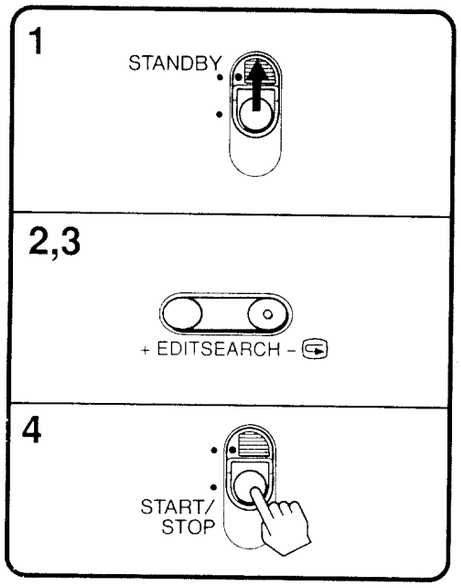
(G-6)

1 Set the camcorder in standby mode by pressing the START/STOP button.

2 Press the – ⏪ side of EDITSEARCH momentarily.
The last few seconds of the recorded portion are rewound and then the recorded picture appears in the viewfinder. After a few seconds of playback, the camcorder goes back to standby mode.

If the picture has not been recorded
The video heads may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette or equivalent.

(G-7)



To Re-record a Previously Recorded Portion

(G-7)

1 Slide STANDBY up.

2 Look in the viewfinder and find the point from where you want to begin the recording by:
Keep pressing the + side of EDITSEARCH to advance the picture at a normal playback speed, or the – side to reverse the picture.

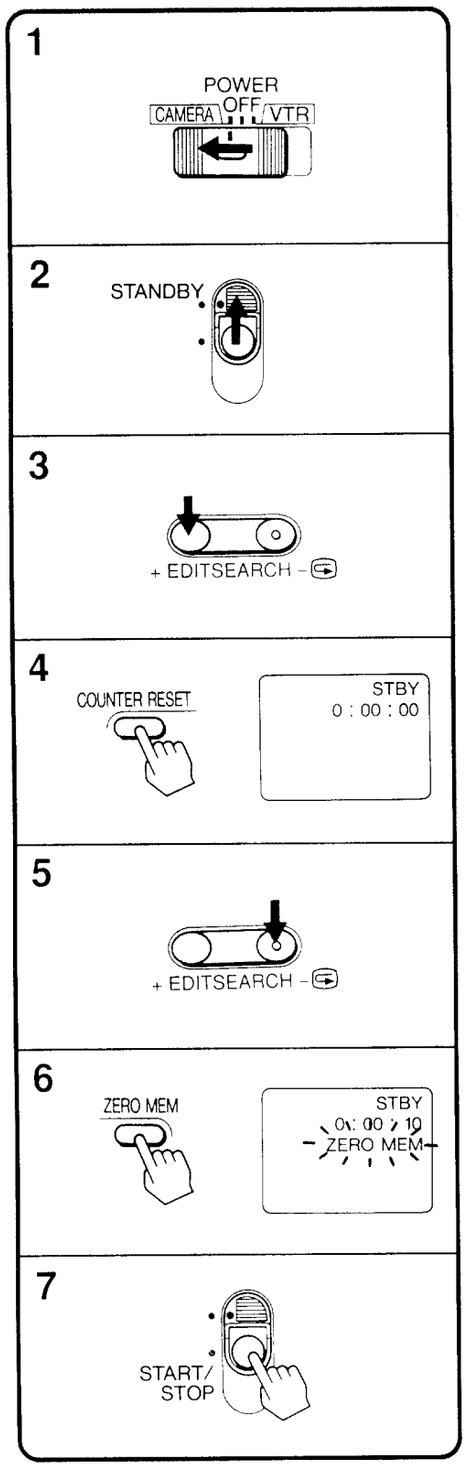
3 At the desired point, release EDITSEARCH.

4 Press START/STOP to start recording.

The picture is connected smoothly after the pre-recorded portion even if STANDBY is slid down and slid up, or even if the power is turned off and on again, provided that the tape is not removed.

To stop
Slide STANDBY down.

(G-8)



To Re-record a Picture in the Middle of a Recorded Tape (Insert Recording)

(G-8)

1 **While pressing the green button, set POWER to CAMERA.**

2 **Slide STANDBY up to set the camcorder to standby mode.**

3 **While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.**
The camcorder is set to standby mode.

4 **Press COUNTER RESET.**
The counter is reset to zero.

5 **While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.**

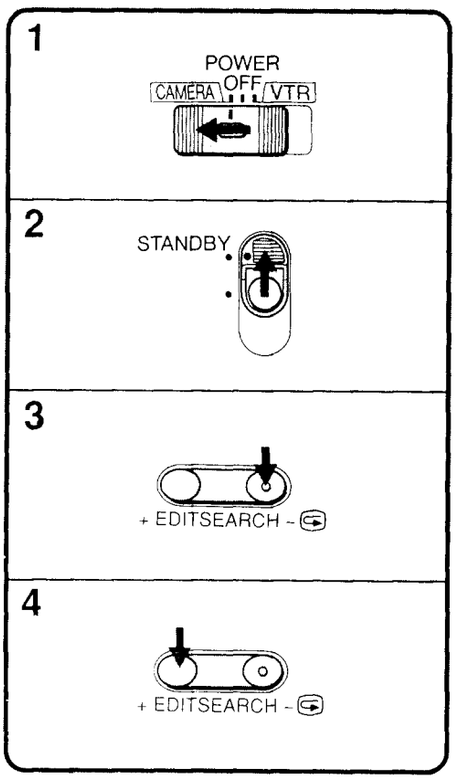
6 **Press ZERO MEM.**
The insert ending point is stored in memory.

7 **Press START/STOP.**
Insert recording begins. The insert recording stops automatically near the counter zero point.

To cancel the ZERO MEM.
Press ZERO MEM.

Note
The picture may be distorted at the ending point when played back.

(G-9)



Playing Back your Picture Instantly

(G-9)

You can check the recorded picture in the viewfinder. Sound is not heard.

1 **While pressing the green button, set POWER to CAMERA.**

2 **Slide STANDBY up.**

3 **Keep pressing the – side of EDITSEARCH to view the playback picture in reverse.**

4 **Keep pressing the + side of EDITSEARCH to view the playback picture.**

To stop the playback, release EDITSEARCH.

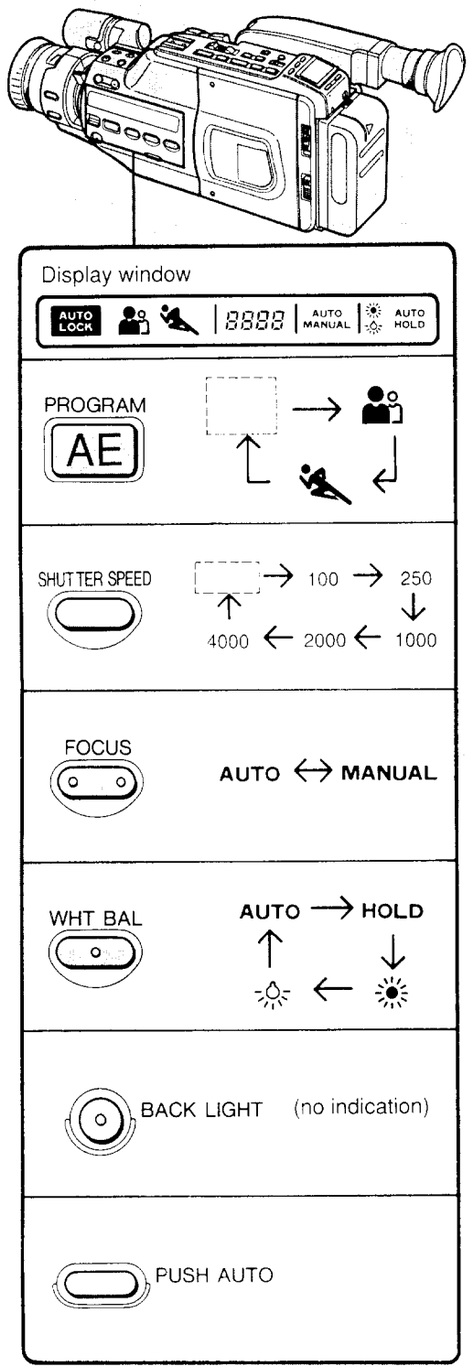
To monitor the sound while viewing the playback picture in the viewfinder

Connect a headphone to the Ω jack.

1. While pressing the green button, set POWER to VTR.
2. Press ◀◀ to rewind the tape and press ⏸ where you want to stop.
3. Press ▷ to start playback.

Selecting the Automatic/ Manual Adjustment

(H-1)



When you set AUTO LOCK to the green position, the white balance, focus and back light are adjusted automatically and the shutter speed is set to 1/60. The automatic function offers you worry-free operation under most shooting conditions. But under certain circumstances, manual adjustment is better for effective recording. For manual adjustment, set AUTO LOCK to the lower position and select an appropriate setting.

Looking over each item (H-1)
Indications in the illustration show those of the display window.
Indications in the viewfinder change as follows.

Program AE:
No indication → → →

Shutter Speed:
No indication (1/60) → 100 → 250 → 1000
4000 ← 2000 ←

Focus:
Autofocus frame (auto) ↔ No indication (manual)

White Balance:
No indication (auto) → HOLD → • →

Back Light:
No indication (auto) ↔

Push Auto:
During recording with manual focusing, as long as you keep the PUSH AUTO button pressed, autofocusing is activated.

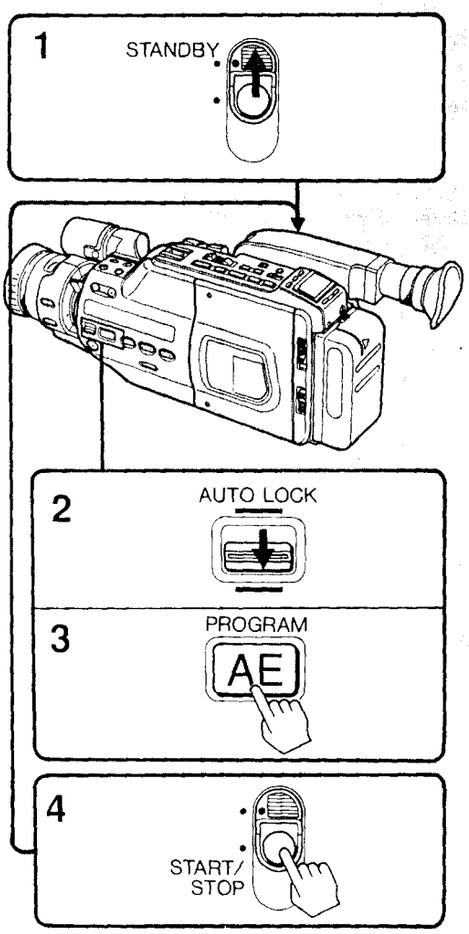
When you attach the battery at the first time
The white balance, focus and exposure are automatically adjusted and the shutter speed is set to normal speed (1/60) regardless of the position of AUTO LOCK.

Notes
- As long as you do not remove the battery, even if you set POWER to OFF, the previous settings are stored.
- When you set AUTO LOCK to the lower position, the items remain in auto mode or previously set manual mode until you change it.

Using the PROGRAM AE button

(I-1)

(I-2)



Besides the automatic and manual modes, this camcorder has the Portrait and Sports modes. You cannot adjust the shutter speed manually while PROGRAM AE is activated.

Using the Portrait Mode

(I-1)

In the portrait mode, the object is in focus and the background is out of focus. The opening of the iris and the shutter speed is automatically adjusted to maintain the appropriate exposure according to the size and brightness of the object. The portrait mode is most effective to be used outdoors.

Use the portrait mode when shooting the following subjects:

- a still subject such as person or flower
- zooming in a subject in the telephoto mode
- subjects beyond obstacles such as net

Operation (I-2)

1 **Slide STANDBY up.**

2 **Set AUTO LOCK to the lower position.**

3 **Press PROGRAM AE until appears in the display window.**

4 **Press START/STOP.**
Recording with the portrait mode starts.

To resume the automatic mode

Press PROGRAM AE until neither nor appears in the display window or set AUTO LOCK to the green position.

Hint for effective camera work

Use of the portrait mode in the following method will gradually bring the background out of focus while keeping the object in focus.

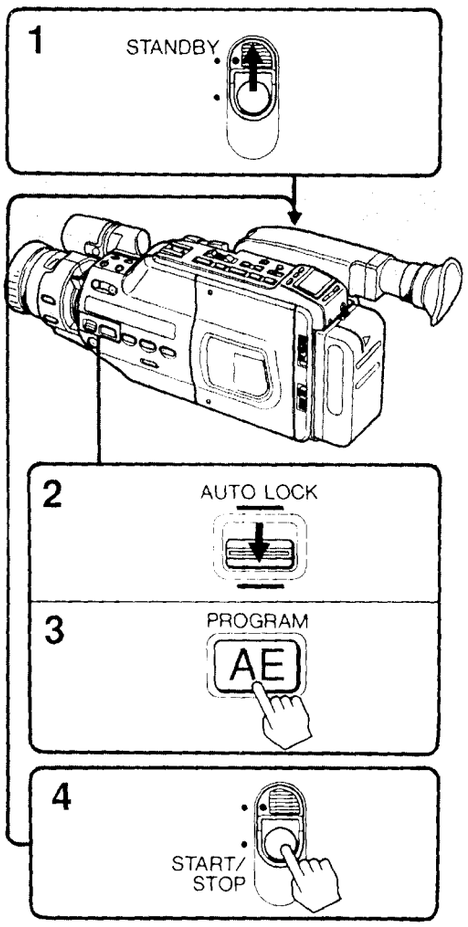
1 Enter the portrait mode.
2 Set the AUTO LOCK switch to the green position and start recording.
3 Set the AUTO LOCK switch to the lower position.
The camcorder will enter the portrait mode and brings the background out of focus.

Note

When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may flicker, or the color of the recorded picture may become unnatural.

(I-3)

(I-4)



Using the Sports Mode

(I-3)

In the sports mode, the shutter speed and the opening of the iris is automatically adjusted to maintain the appropriate exposure according to the speed of the object. An object moving in high speed can be recorded and the picture can be observed more clearly with less picture shaking in the still or slow mode. The sports mode achieves more effective recording compared to using the SHUTTER SPEED select button.

Use the sports mode when shooting following subjects:

- outdoor sports scene such as football, tennis or golf
- recording a landscape in the running car

Operation (I-4)

1 Slide STANDBY up.

2 Set AUTO LOCK to the lower position.

3 Press PROGRAM AE until appears in the display window.

4 Press START/STOP.
Recording with the sports mode starts.

To resume the automatic mode

Press PROGRAM AE until neither nor appears in the display window or set AUTO LOCK to the green position.

Hint for effective camera work

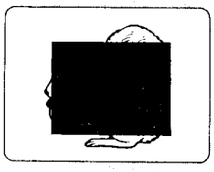
When shoting athletic matches from a distant, such as a football game, we tend to zoom from the wide to the telephoto position to catch the once-only events. Even udner these circumstances, by using the sports mode, a sharp picture can be obtained when played back later in the slow or still mode.

Notes

- The sports mode is effective under sufficient lighting, such as under sunlight. When used under extremely dark conditions, the shutter speed may not be shifted to high speeds.
- When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may flicker, or the color of the recorded picture may become unnatural.

Manual Focusing

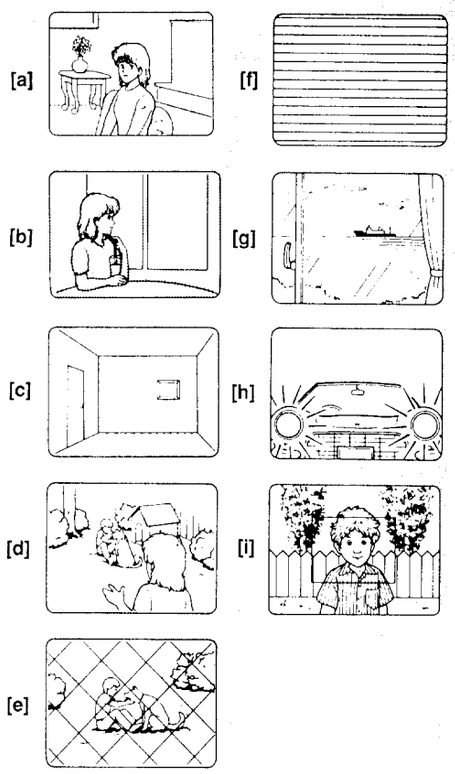
(J-1)



When you set AUTO LOCK to the green position and set the subject to the center of the viewfinder, the autofocusing functions and you can easily get a focused picture under most shooting conditions. **(J-1)** But manual focusing is recommended in the following cases.
[a] to [i] correspond to the illustrations. **(J-2)**

[a] Insufficient light
[b] Too much brightness behind the subject
[c] Subjects with little contrast-wall, sky, etc.
[d] One subject is close; the other is in the center, but at a distance
[e] Subjects beyond nets, etc. or another subject passes in front of the camcorder
[f] Horizontal stripes
[g] Subject through frosted glass
[h] Bright subject or subject reflecting light
[i] High contrast behind the subject (The background may be focused.)
- When you use conversion lenses or effect filters
- When shooting in close-up (Macro)
- When shooting a stationary subject using a tripod
- To save battery wear

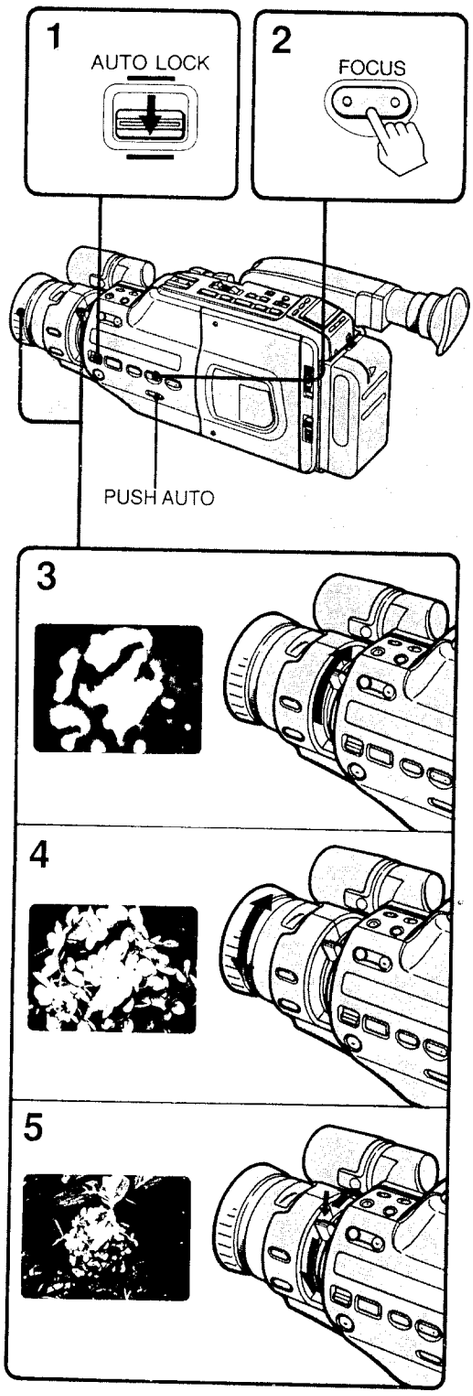
(J-2)



Autofocusing does not function momentarily when:
- The shutter speed is changed, or the back light adjustment is changed to manual mode.
- Lighting conditions change quickly.
- Zooming is done from wide-range to telephoto.

This camcorder keeps in focus by referring to the picture contrast, which is weak in the above situations.

(J-3)



Focusing Manually

(J-3)

1 **Set AUTO LOCK to the lower position.**

2 **Press FOCUS.**
Make sure that the autofocus zone in the viewfinder disappears.

3 **Turn the manual zoom lever fully to the telephoto position.**

4 **Turn the focus ring to achieve sharp focus.**

5 **Set the desired shot length using the manual zoom lever, while pressing the gray button for wide-angle.**

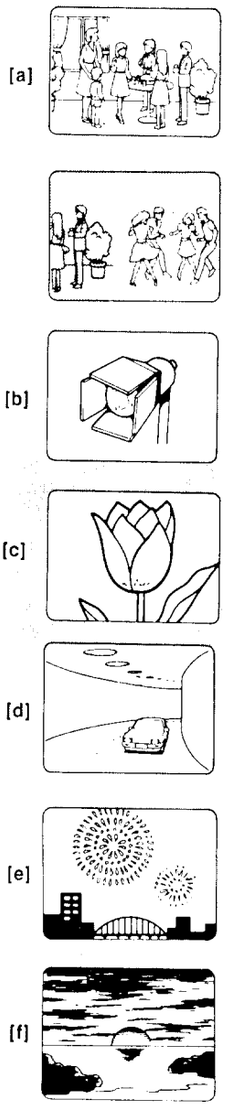
Shooting with autofocusing momentarily
While shooting with manual focusing, press PUSH AUTO.
The autofocus functions **while you are pressing the button**. When you release the button, manual focusing will be resumed. Use this button when you change the focus from one subject to another. The focusing performs naturally.
The previous settings except for focusing are retained.

Some helpful hints

- When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results. shoot at wide angles after focusing in telephoto.
- When shooting a scene with lots of movement in bright light, set the zoom lever to the wide-angle position and the focus ring to 2 to 3 m (7 to 10 ft).

Adjusting the White Balance

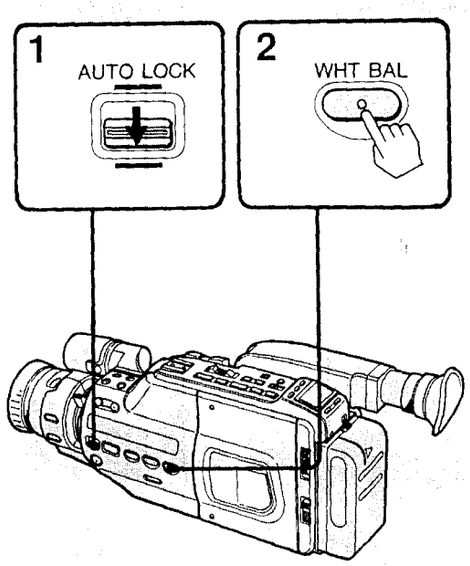
(K-1)



When you set AUTO LOCK to the green position (AUTO), the auto white balance function of this camcorder adjusts the picture to natural colors under most shooting conditions. However; in the conditions listed below, adjust the white balance manually.
[a] to [f] correspond to the illustrations **(K-1)**

	Conditions	Indication in the viewfinder
[a]	Lighting conditions change quickly	☼
[b]	Too bright, such as in photograph studios	☼
[c]	Monochromatic subject or background	HOLD
[d]	Under a sodium lamp	☼
	Under a mercury lamp	☼
	Under a color matching fluoresent lamp	•
[e]	Recording outdoors: a night view, neon signs or fireworks	•
[f]	Recording outdoors: scenes after sunset or before sunrise	•

(K-2)



Adjusting the White Balance Manually

(K-2)

1 **Set AUTO LOCK to the lower position.**

2 **Select the desired white balance mode by pressing WHT BAL.**
Each time you press the button, the indications changes as follows.

No indication → HOLD → ☀ → ☁

Note on manual adjustment
When moving from indoors to outdoors, or vice versa, set AUTO LOCK to the green position and adjust the white balance in auto mode, then reset to the lower position again.

What is the HOLD mode?

In the HOLD mode, the camcorder adjusts to the color temperature of the subject's light source automatically and keeps that temperature during recording. When recording some subjects with different color temperatures, use the HOLD mode to set a color temperature and you can achieve a recording with natural colors without being affected by the surroundings.

To set into the HOLD mode

1 Set AUTO LOCK to the lower position and press WHT BAL to set to Auto (no indication).
2 Point at and record a white, flat object such as a white wall, or paper.
3 Press WHT BAL.
The HOLD mark appears in the viewfinder.

When you change the battery pack, setting of the white balance, or the light source, follow the procedures above again.

Color Temperature and White Balance

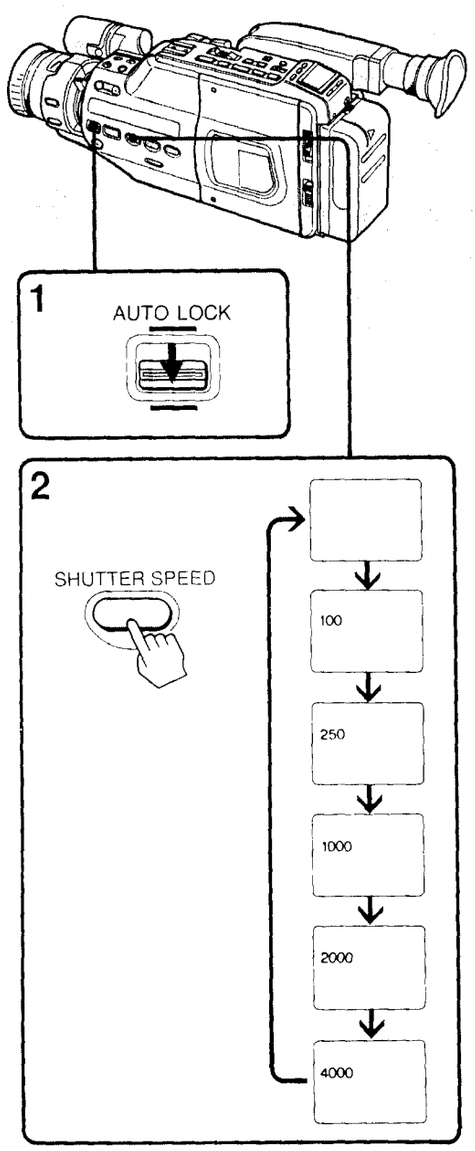
The color temperature indicates a property of light and is measured in K (Kelvin). It increases as the light source gets bluer and decreases as the light source gets redder. It has no direct relationship with brightness.
The camcorder automatically adjusts the white balance within the range shown below.

Color temperature (K)		Light source
↑ Blue	10,000	Clear sky
	8,000	Slightly overcast
	7,000	Cloudy, rainy
	6,000	Fluorescent lamp (daylight)
White	5,000	
	4,000	Direct sunlight
	3,500	Fluorescent lamp (white) 1 hr. after/before sunrise/ sunset
		Fluorescent lamp (off-white) Studio lamp Halogen lamp
	3,200	
Yellow	3,000	Tungsten lamp
	2,500	30 min. after/before sunrise/ sunset
↓ Red	2,000	Sunrise/sunset Candlelight

Setting Shutter Speed

(L-1)

(L-2)



(L-1)

When you record a fast-moving subject, set the shutter speed at a higher.The movement will look more clearly when played back in pause mode.
Remember that you record in a brighter place than usual.

Recommended setting for your situation

Example use	Recommended shutter speed
• On clear days, recording golf or tennis swing (To view the hit ball clearly in the still picture mode, set to 1/4000) • Recording skiers	1/4000 or 1/2000
• On overcast days, recording a moving merry-go-round or roller coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
• Instead of the ND2 filter (To reduce the exposure level to about a half) • Recording indoor sports (for stable shooting)	1/100

Selecting the Shutter Speed (L-2)

1 Set AUTO LOCK to the lower position.
Make sure that neither 🏃 or 🚶 appears in the display window.

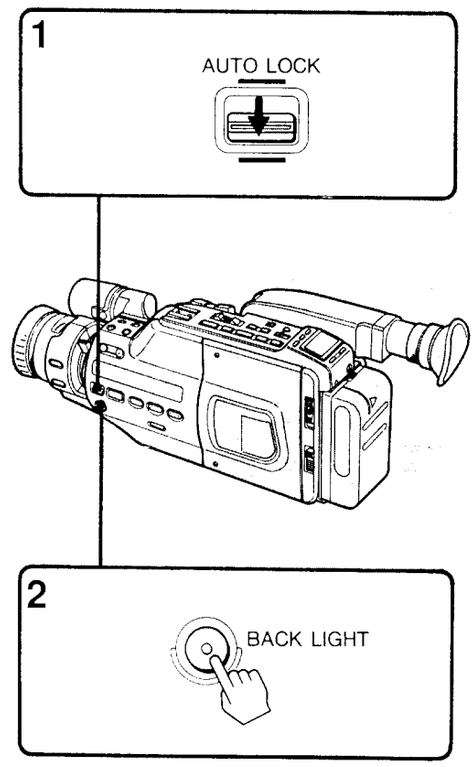
2 Press SHUTTER SPEED repeatedly until the desired shutter speed indication appears.

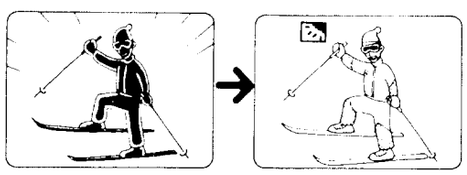
Notes

- When you select shutter speed 1/250 or faster, record under sunlight or use a video light.
- When you record a TV screen with certain shutter speeds, the brightness of the recorded picture may vary.
- When you shoot a very bright subject at a faster shutter speed, a light vertical, belt-like line ("smear") may appear on the screen.
- When you record at certain shutter speeds under a light discharged tube, such as a fluorescent lamp, sodium lamp or mercury lamp, the brightness of the recorded picture may vary ("flicker").

Shooting with Backlighting

(M)





In this camcorder, the exposure is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button. **(M)**

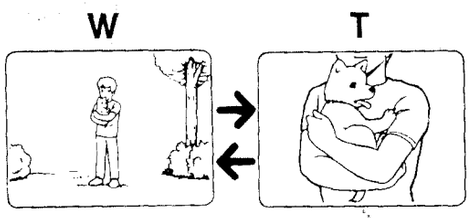
1 **Set AUTO LOCK to the lower position.**

2 **Press BACK LIGHT.**
The ⧉ indication appears. If it does not appear, press the button again.

After shooting
Be sure to release this adjustment condition by pressing BACK LIGHT again. (The ⧉ indication goes out.)
Otherwise, the recorded picture will be too bright.

Zooming

(N-1)



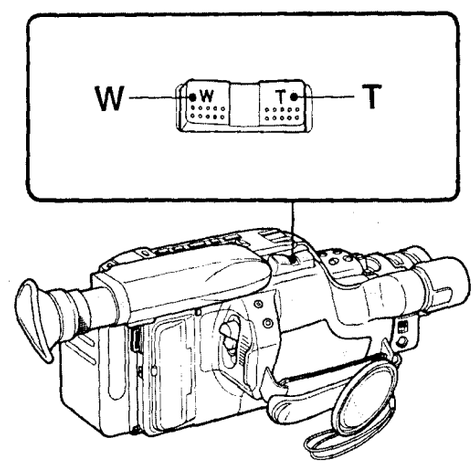
The size of the subject in the scene can be changed. Use "zoom-in" for dramatic close-ups. Use "zoom-out" for panoramic long shots. Also use zooming to focus manually or to decide the shooting angle. **(N-1)**

Power Zooming

— for smooth and constant zooming (N-2)

Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

(N-2)



Zooming Manually

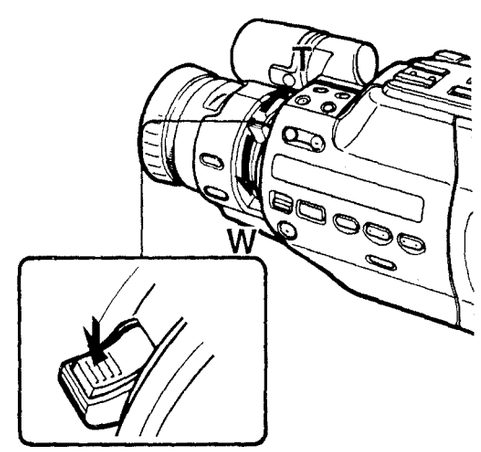
— for creating a dramatic effect (N-3)

Turn the manual zoom lever upward for telephoto and downward for wide-angle.
Be sure to keep pressing the gray button on the lever when turning it downward.

Focal length of this camcorder

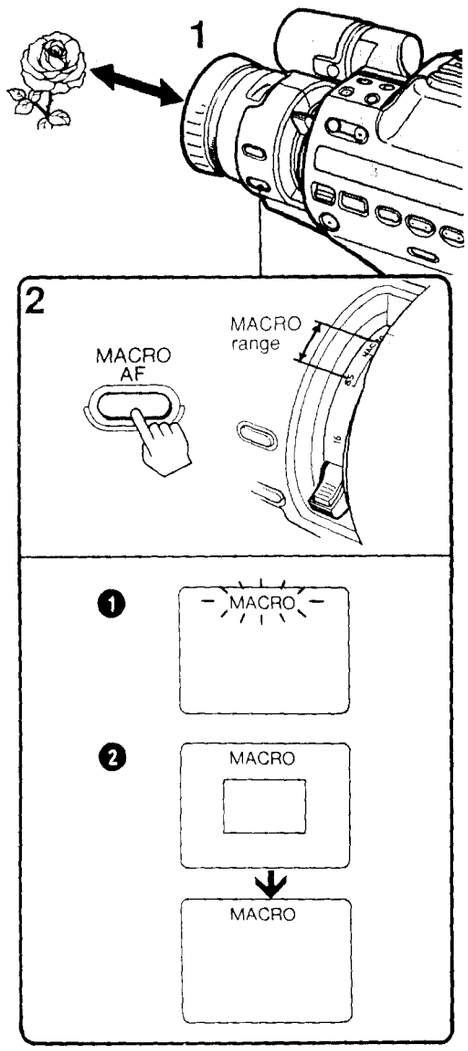
The focal length is 8.5 mm to 68 mm (1/3 to 2 3/4 inches). This means approximately 45 mm to 363 mm (1 3/4 to 14 3/8 inches) converted into the focal length of a 35-mm camera.

(N-3)

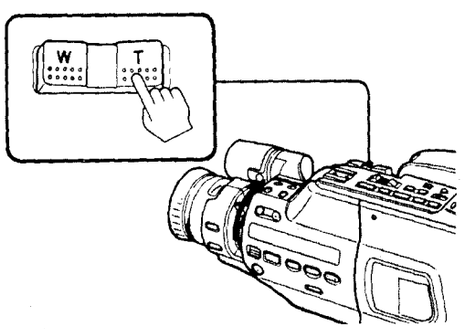


Close-up (Autofocusing in Macro)

(O-1)



(O-2)



Even tiny subjects, such as flowers, insects, photographs, can literally fill the screen with autofocusing in macro.
This is useful also when storing a title (page 43).
(O-1)

1 Bring the camcorder as close as necessary to obtain the desired subject size.
This subject can be as close as a minimum of 10 mm ($^{13}/_{32}$ inches) from the lens surface.

2 Press MACRO AF.

❶ The zoom lever turns automatically to the MACRO range.
The MACRO indication blinks in the viewfinder and lights steadily when the zoom lever enters the MACRO range.

❷ The autofocus zone appears in the viewfinder and the focus is adjusted automatically.
The frame disappears when sharp focus is achieved.

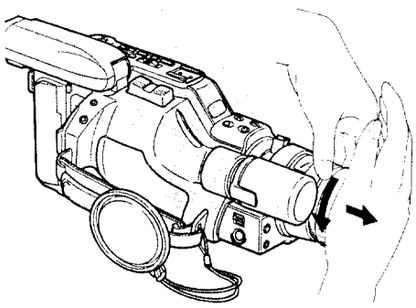
To release this adjustment setting
Press the T side of the power zoom button or turn the zoom lever to return the lever to the ordinary range. **(O-2)**

If the autofocus zone disappears before focusing sharply
The autofocus zone disappears if sharp focus cannot be achieved within 30 seconds. In this case, press MACRO AF again to re-function autofocusing in macro.
If you still do not get a sharp focus, manual focusing is recommended (see page 41). Adjust it after the autofocus zone goes out.

To keep autofocus functioning
Keep MACRO AF pressed.
Contrary to the ordinary autofocusing, autofocusing in macro is released each time the sharp focus is achieved.

Close-up (Autofocusing in Macro)

(O-3)



Notes

- This function has no connection with the AUTO LOCK switch. You can use autofocusing in macro while manually adjusting the ordinary focus, etc.
- Do not press the power zoom button while the zoom lever is moving for autofocusing in macro. Otherwise, autofocusing is released.

Manual focusing in macro

1 Turn the zoom lever to the MACRO range without pressing the gray button on it.
The MACRO indication lights up in the viewfinder.
2 Turn the zoom lever within the MACRO range to focus sharply.

If the lens hood touches the subject

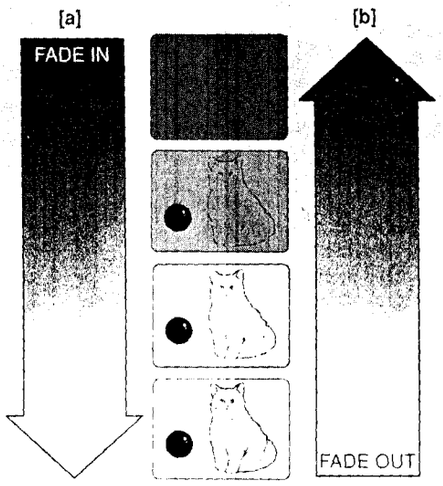
Remove the lens hood. Hold the focus ring and turn the hood by pressing it with your palm. **(O-3)**
Do the same when attaching/removing a filter or conversion lens (not supplied).

Recommended accessory

When shooting in macro, the depth of field is very shallow, so pay attention to focusing. To keep the subject in focus, use a tripod.

Fade-in and Fade-out

(P-1)



When fading-in, the picture will gradually appear from black.
The sound will also be gradually increased. **(P-1 [a])**
When fading-out, the picture will gradually fade to black. The sound will be decreased. **(P-1 [b])**
This function will give your recording a professional appearance.

To Fade-in

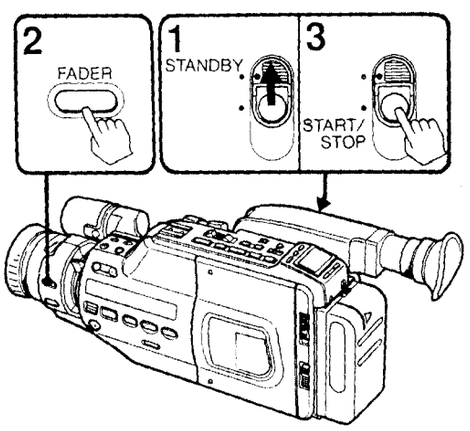
(P-2)

1 **Slide STANDBY up to set the camcorder in the standby mode.**

2 **Press FADER.**

3 **Press START/STOP.**
Fade-in is performed and recording will start.

(P-2)



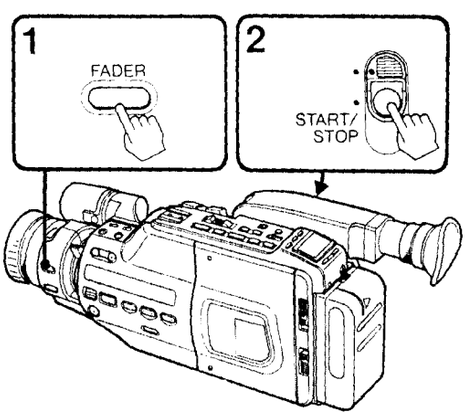
To Fade-out

(P-3)

1 **While recording, press FADER.**

2 **Press START/STOP to stop recording.**
Fade-out is performed and then recording stops.

(P-3)



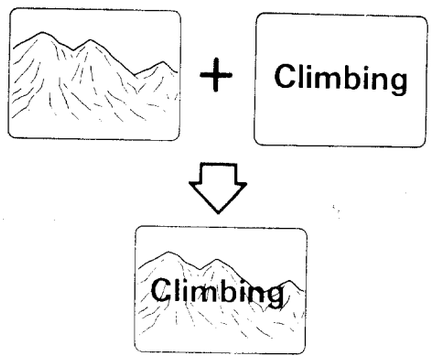
To cancel the fade-in/fade-out function
Before pressing START/STOP, press FADER again.

If you want to use the fade-in/fade-out function repeatedly
Start from step 1 each time.

When the title (page 44), date/time (page 25), or age (page 49) is displayed
The title, date/time, or age does not fade-in or fade-out.

Recording a Title

(Q-1)



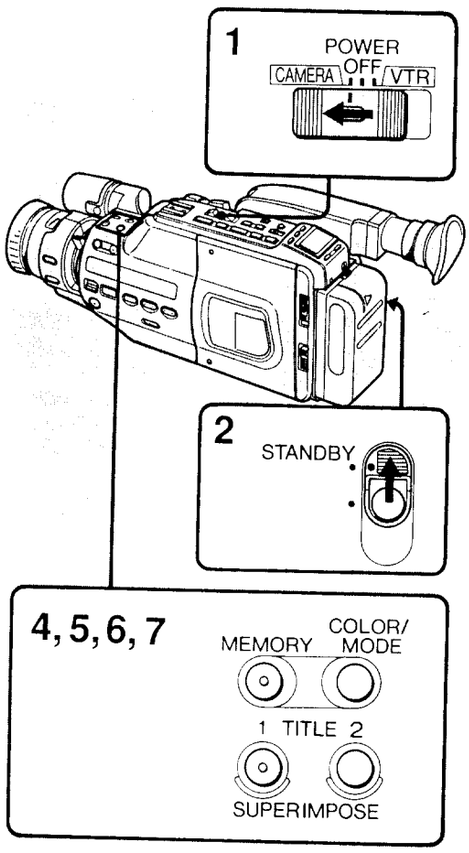
You can superimpose your own hand-lettered message or illustration over the picture during recording or playback (editing). **(Q-1)**

- Two titles can be stored.
- The color of the title can be selected from 8 colors.
- You can use the titles separately or simultaneously.
- You can record a picture with one title and display another title on this picture during playback.

Before recording, store a message or an illustration.

Storing a Title (Q-2)

(Q-2)



Before storing

- Make a desired title card.
  Use a plain, white card and draw a title with a dark color in thick letters.
- Install the lithium battery. (page 19)

Operation

1 **While pressing the green button, set POWER to CAMERA.**

2 **Slide STANDBY up to set the camcorder in the standby mode.**

3 **Point the camcorder to the title card and adjust the focus.**

4 **Press TITLE 1 or 2.**

5 **Press MEMORY to store the title.**

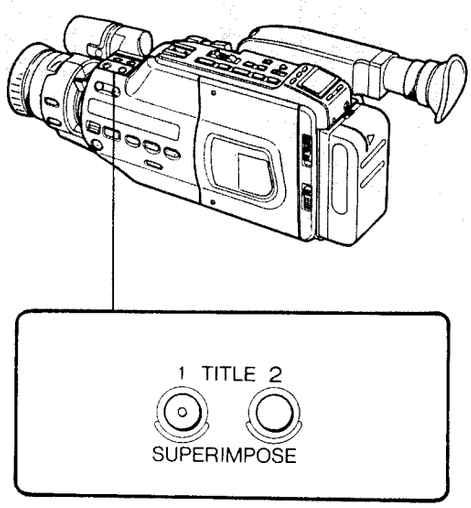
6 **Press COLOR/MODE and select the title color.**
Each time you press the button, the indication changes as follows.

WHT (white) → BLUE → GRN (green) → CYAN → RED
↳ BLK (black) ← YEL (yellow) ← VIO (violet) ←┘

7 **Press TITLE 1 or 2 which is pressed in step 4 to turn off the title.**

To check the title
Press TITLE 1 or 2 in the standby mode.
To turn off the title, press the button again.

(Q-3)



Superimposing the Title on a Picture

(Q-3)

1 **During playback or recording, press TITLE 1 or 2 at the point from which you want to insert the title.**
The title is displayed. During recording, the title is recorded.

2 **Wait for a while and press TITLE 1 or 2, whichever was pressed in Step 1, again.**
The title goes out.

Superimposing two titles on a picture

1 During playback or recording, press TITLE 1 and 2 at the point from which you want to insert the titles.
To display title 1 in front of title 2:
while pressing TITLE 2, press TITLE 1.
To display title 2 in front of title 1:
while pressing TITLE 1, press TITLE 2.

2 Wait for a while and press TITLE 1 or 2.
The titles go out.

When recording the title at the beginning, or two titles simultaneously

We recommend the following method:
1 Set the camcorder in the standby mode before step 1 above.
2 Release the standby mode after displaying the title, then go to step 2 above.

If you want to record the title during playback

Make connections for editing and record the title on another VCR. (See page 55 and 56).
During playback, the title cannot be recorded on this camcorder.

About the color indication

- The color indication in the viewfinder is not recorded.
- You can change the title color by pressing COLOR/MODE even after displaying the title.

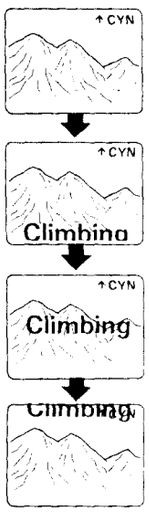
About the display mode indication

The display mode indication in the viewfinder is not recorded.

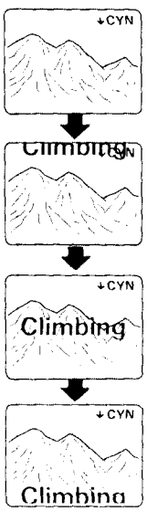
When displaying the title in the playback mode

The title goes out if you press EDITSEARCH.

(Q-4)

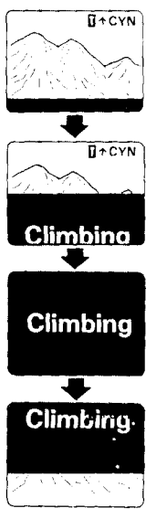


(Q-5)

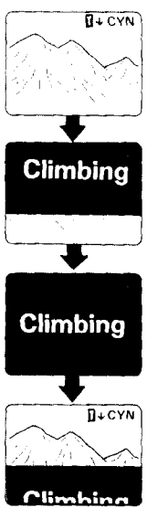


(Q-6)

(Q-7)



(Q-8)



Various Display Modes of the Title

Display mode	Indication in the viewfinder
Scrolling up the title (Q-4) The title scrolls up and stops at the center.	↑
Scrolling down the title (Q-5) The title scrolls down and stops at the center.	↓
Reversing the title with the picture (Q-6)	▯
Scrolling up the reversed title (Q-7)	▯↑
Scrolling down the reversed title (Q-8)	▯↓
Normal display mode	No indication

Selecting the display mode
Before displaying the title, press COLOR/MODE until the indication of the mode you want appears. (Q-9 in page 46)

After selecting the mode, follow the procedure on page 44 to superimpose the title on the picture in that mode.

Note on scrolling
You can scroll the title only when the camcorder is in the recording standby, recording, or normal playback mode. In the other modes (see "Playing back a Tape" on page 52), you can select only reversing (▯) or normal display mode. Also scrolling will be cancelled when you set the camcorder in the other modes after selecting scrolling.

About memory back up
The camcorder uses the lithium battery on the bottom to keep the title in memory. On lithium battery life, see page 19.

(Q-9)

Function of the COLOR/MODE button
This button has a double function: one is to select the title color and the other is to select the title display mode.
Its function depends on if the title is displayed or not. (Q-9)

To select the color
1 Press TITLE 1 or 2 to display the title.
2 Press COLOR/MODE.
Each time you press the button, the color indication changes as follows:
WHT (white) → BLUE → GRN (green) → CYAN → RED
↑— BLK (black) ← YEL (yellow) ← VIO (violet) ←↵

To select the mode
1 If the title is displayed, press TITLE 1 or 2 so that the title disappears.
2 Press COLOR/MODE.
Each time you press the button, the mode indication changes as follows:
No indication (normal mode) → ↑
▯↓ ← ▯↑ ← ▯ ← ↓ ←——————┘

↑ : Title scroll up mode
↓ : Title scroll down mode
▯ : Title reverse mode
▯↑ : Title reverse and scroll up mode
▯↓ : Title reverse and scroll down mode

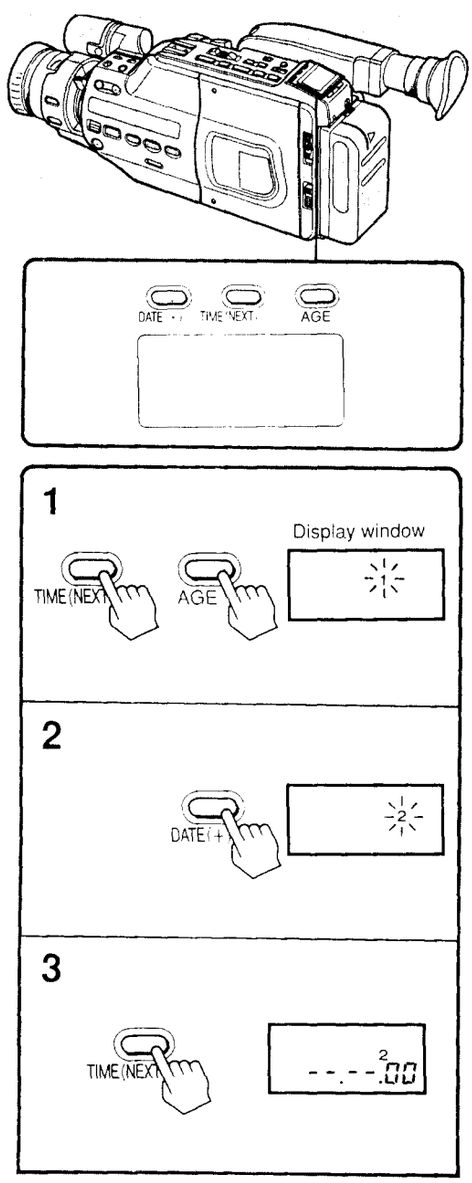
When you display both titles simultaneously
You can display both titles only in the same mode.
To scroll both titles simultaneously, display the titles as descibed in "Superimposing two titles on a picture" (page 44), however, press the first and second buttons continuously.

To change the color of the titles displayed simultaneously
- If you want to change the color of the title in back, press COLOR/MODE to change the color.
- If you want to change the color of the title in front, proceed as follows.

1 Press TITLE 1 and 2 so that the titles disappear.
2 Press TITLE 1 or 2 to display the title which you want to change the color.
3 Press COLOR/MODE to change the color.
4 Press the same button as in step 2 so that the title disappears.
5 Display both titles as described in "Superimposing two titles on a picture" (page 44).

Recording the Age of Your Child

(R-1)



You can record the age (in years and months) of your child, by presetting his/her birth date. Besides age, you can also preset the date of a specific event, and record how many years and months have passed since then.
You can record up to 3 ages or events.

Storing the Birth Date or Special Event

Before you begin

- Make sure that a power source is connected.
- Set POWER to CAMERA.
- Slide STANDBY up.
- Make sure that the date is correctly set.

Operation (R-1)
Example: Store "Aug. 3, 1987" in memory 2

1 **Press TIME (NEXT) and AGE simultaneously for more than 3 seconds until the "1" indication appears and "1" blinks in the display window.**

2 **Press DATE (+) to select 2.**
Each time you press DATE (+), the display in the display window changes as follows:
1 → 2 → 3

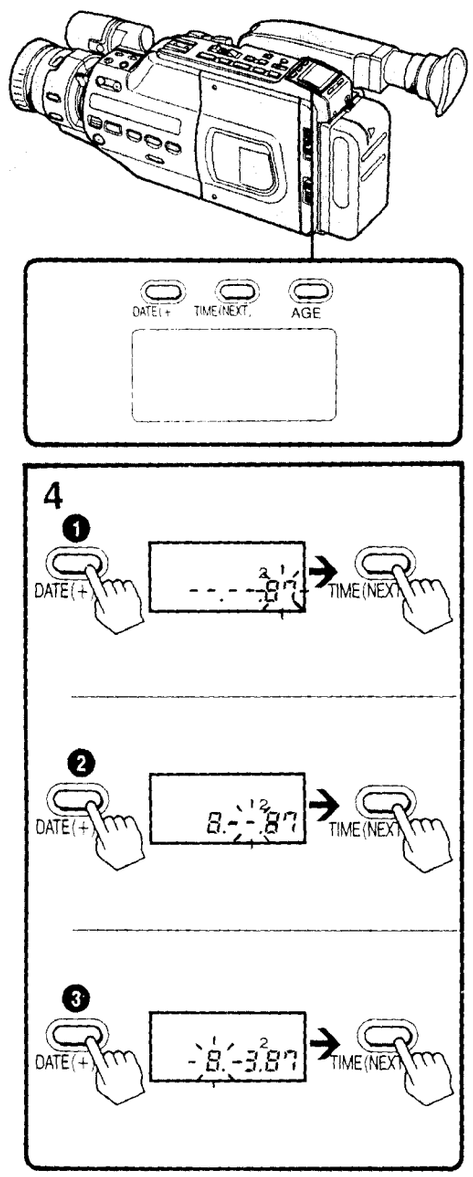
In the viewfinder, the display changes as follows:
[1] BIRTHDAY → [2] BIRTHDAY
[3] EVENT* →

* Although "EVENT" is displayed on [3], you can use it for age as well.
[1] and [2] can also be used for event.

3 **Press TIME (NEXT).**
"--. --. 00" appears.

(Continued)

(R-2)



(R-2)

4 Adjust the year, month and day.
First adjust the blinking digits with DATE (+), and then press TIME (NEXT).
The age (year and month) appears when all the items are adjusted.

If you missed the correct number with DATE (+)
Keep pressing DATE (+).
The indication changes as follows:
Year: 00 → 01 → Current year
↑ └Current year – 99 ┘

Month: 1 → 2 - - - → 12 → --
↑ ┘

Day: 1 → 2 - - - → 31 → - -
↑ ┘

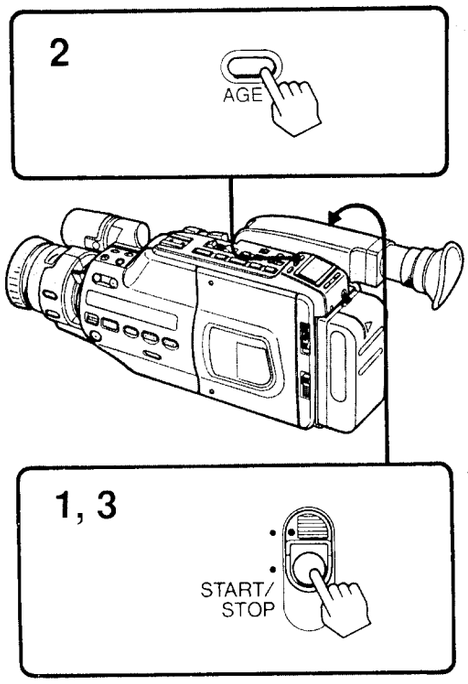
To correct/change the setting
Follow the procedures from step 1 again.

To advance the digits faster
Keep DATE (+) pressed.

To preset the year before 1900
1 After step 3 on page 47, keep pressing DATE (+) until the current year is displayed.
2 Press DATE (+) again.
The year goes back 99 years.
(example: 1990 → 1891)
3 Go to step 4 above.

When in 2000
"--. --. 01" is displayed in step 3 on page 47. After that, it advances every year as "1902, 1903, ... ".

(R-3)



Recording the Age

(R-3)

1 During recording, press START/STOP at the point where you want to insert the age of a person or the elapsed time.
The camcorder is set in standby mode.

2 Press AGE to select the indication you want to record.
Each time you press AGE, the indication changes as follows:

No indication → [1] The first age

[3] Anniversary ← [2] The second age

An item with no presetting is skipped.
The [1], [2], or [3] indication goes out after one second.

3 Press START/STOP.
Recording starts again.
The indication in the viewfinder is recorded with the picture.

To stop recording the age
Press AGE until the indication goes out.

To change the display while recording
Press AGE until the indication you want to record is displayed. Recording of the indication you selected starts when [1], [2], or [3] goes out.

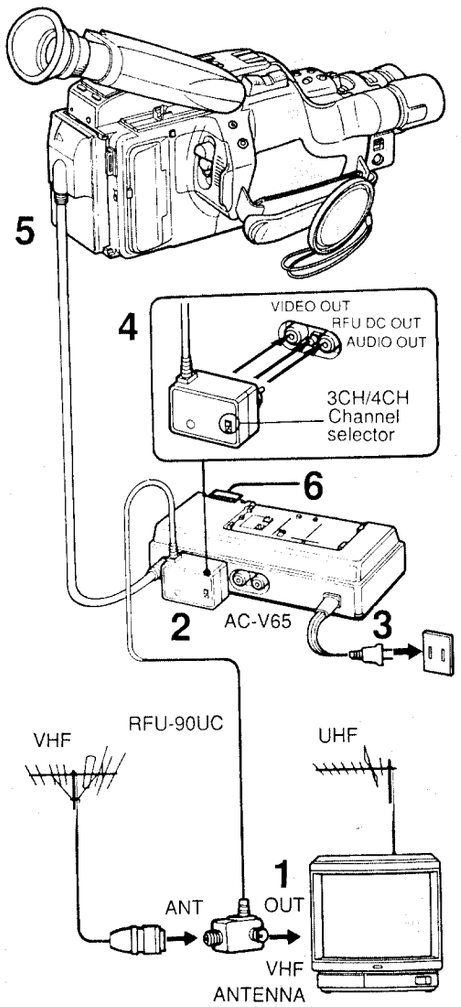
To cancel the stored birth date or special day
1 Perform steps 1 and 2 in "Storing the birth date or special event" to select the memory number to be canceled.
2 Press TIME (NEXT) twice.
The month indication blinks.
3 Press DATE (+) until -- appears.
4 Press TIME (NEXT).
The birth date/special day is deleted from the memory and is not displayed when you press AGE.

If you do not record the age while recording
You cannot add it later during playing back or editing. Be sure to follow the procedure "Recording the Age" while recording.

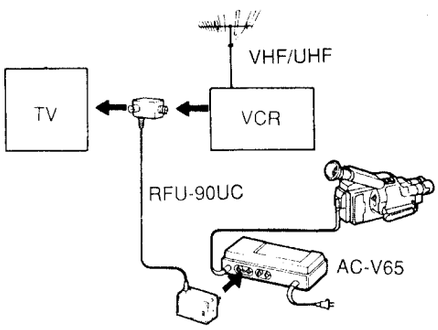
About memory back-up
The camcorder uses the lithium battery on the bottom to keep the birth date/event date in memory. On lithium battery life, see page 19.

When you connect the camcorder to a TV
If you do not use the data-screen function, the age indication will appear on the TV screen when the [1], [2], or [3] indication goes out in the viewfinder and recording starts.

(S-1)



(S-2)



You can easily make a proper connection of camcorder and TV by using the supplied AC-V65 AC power adaptor.
Check the type of your TV, and go to the appropriate section.

You can also connect the camcorder directly to the TV, using the VIDEO and AUDIO L/R jacks. In this case, be sure to set the IN/OUT selector to OUT.

Connecting a TV without Video/Audio Jacks (S-1)

The supplied RFU-90UC RFU adaptor and AC power adaptor are required.The playback sound is monaural.
Make sure that the TV is turned off to prevent the speaking damaged.

1 **Connect the antenna and TV to the RFU adaptor.**

2 **Connect the RFU adaptor to the AC power adaptor.**

3 **Connect the AC power adaptor to a wall outlet.**

4 **If you have connected your TV using only the antenna socket, set the channel selector on the RFU adaptor to 3CH or 4CH of the VHF channel, whichever is not active in your area.**
One of the TV channels will be adjusted to receive the camcorder's playback signal.

Usually keep the AC power adaptor and the TV connected.

Whenever playing back tape

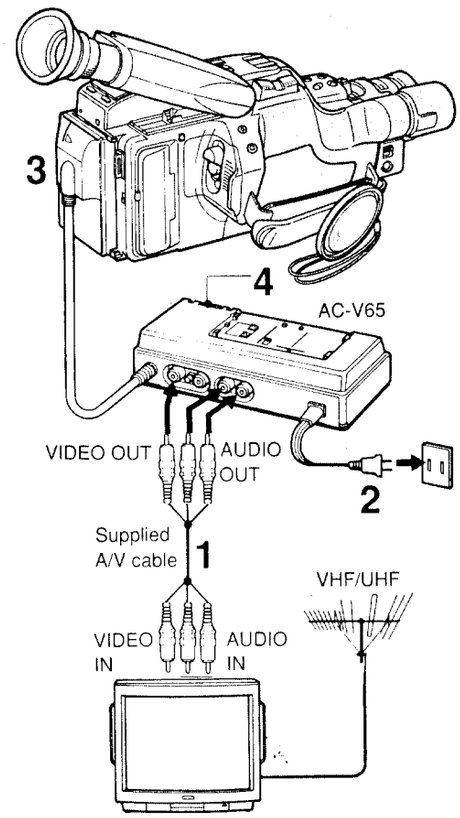
Proceed only the following two steps.

5 **Attach the connecting plate of the AC power adaptor to the camcorder.**

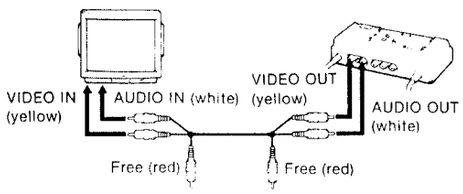
6 **Set the CHARGE/VTR selector on the AC power adaptor to VTR (DC OUT).**

If your TV is connected with a VCR (S-2)
Disconnect the antenna connection of the TV and the VCR, and insert the RFU adaptor between them.

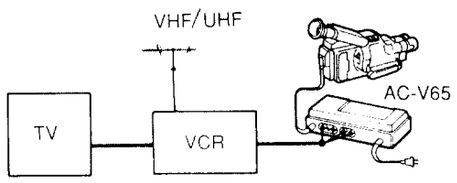
(S-3)



(S-4)



(S-5)



Connecting a TV with Video/Audio Input Jacks (S-4)

By connecting the stereo type TV as shown in (S-3), you can enjoy the stereo sound.
The supplied AC-V65 AC power adaptor and A/V cable are required.
Make sure that the TV is turned off to prevent the speaker being damaged.

1 Connect the AC power adaptor to the TV.
Use the supplied A/V cable.

2 Connect the AC power adaptor to a wall outlet.

Usually keep the AC power adaptor and the TV connected.

Whenever playing back a tape

Proceed only the following two steps.

3 Attach the connecting plate of the AC power adaptor to the camcorder.

4 Set the CHARGE/VTR selector on the AC power adaptor to VTR (DC OUT).

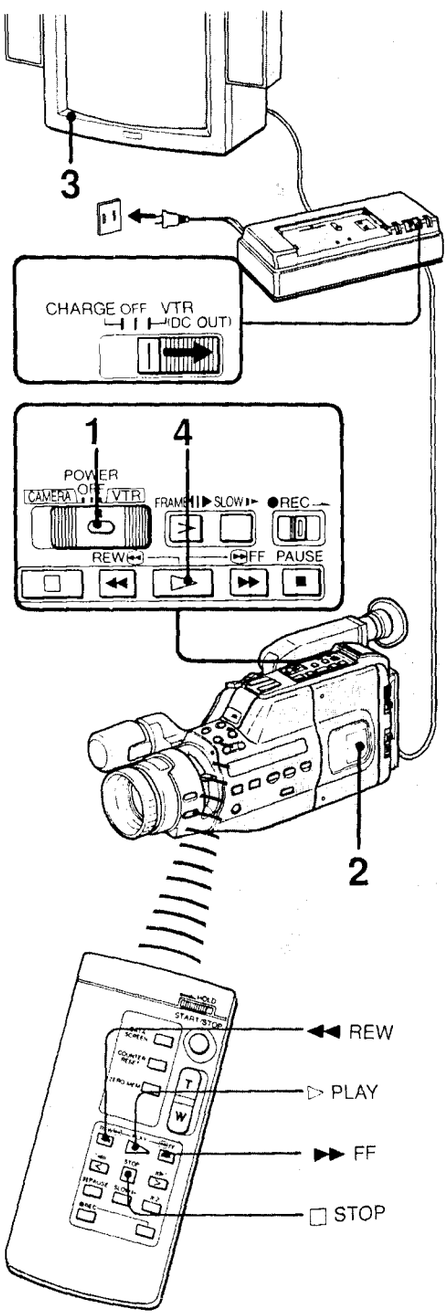
If your TV is a monaural type
Connect as shown in (S-4).
Set HiFi SOUND on the camcorder to ● or 1.

If your TV is a monaural type and connect the camcorder directly to the TV
1 Connect the yellow pin to VIDEO and the white pin to AUDIO L of the camcorder.
2 Connect the yellow and white pins to AUDIO/VIDEO IN of the TV.
3 Set the IN/OUT selector on the camcorder to OUT.
4 Set HiFi SOUND on the camcorder to ●.

If your TV is connected with a VCR (S-5)
Connect the AC power adaptor to the VCR instead of the TV.
Set the input selector of the VCR to LINE, if available.

Playing Back a Tape

(T-1)



The supplied wireless Remote Commander is useful to control the camcorder from a distance. When using it, be sure to set the R REMOTE COMMANDER switch to ON.
(T-1)

1 **Set POWER to VTR while pressing the green button.**

2 **Insert a tape.**

3 **Turn on the TV (or the VCR).**
For a TV with video/audio input jacks, set the TV/VIDEO selector to VIDEO.
For a TV without video/audio input jacks, select the channel for playing back the camcorder.

4 **Press ▷.**
Playback begins.

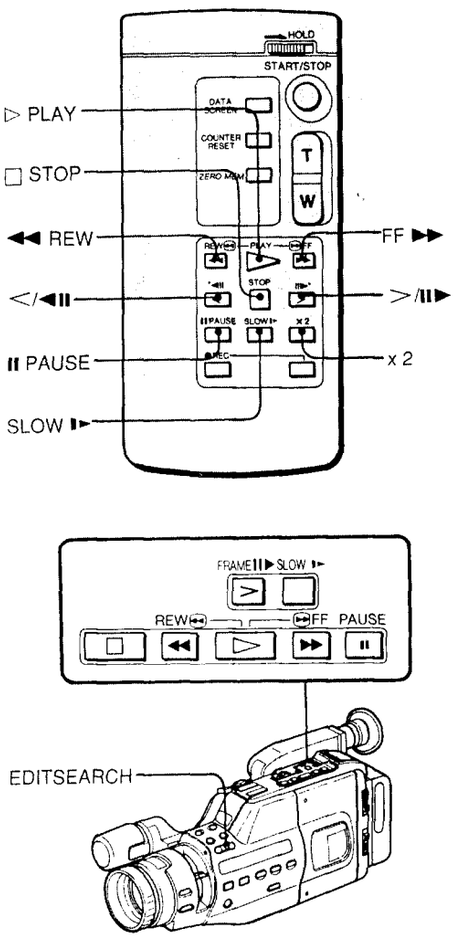
To stop playback, press □.
To rewind the tape, press ◀◀.
To advance the tape rapidly, press ▶▶.

To make the same indications in the viewfinder on the TV, press DATA SCREEN. To clear them, press it again.

After playing back
Set the POWER switch on the camcorder and CHARGE/VTR selector on the AC power adaptor to OFF.

Note
If POWER is set to CAMERA during playback, the tape stops and the camcorder enters the recording standby mode, resulting in the drain of the battery.

(T-2)



Various Playback Modes

(T-2)

To view the still picture (playback pause)
Press PAUSE II during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ or II.

To change the playback direction
Press < /◀II for the reverse or > /II▶ for the forward direction during playback. > on the camcorder is only for the forward direction.
◀ or ▶ appears in the viewfinder.

To view the picture at 1/5 speed (slow playback)
Select the playback direction with < /◀II or > /II▶, and then press SLOW ▮▶ during playback.
SLOW ▮▶ on the camcorder is only for the forward direction.
◀▮ or ▮▶ appears in the viewfinder.
When slow playback lasts for 1 minute or more, the forward or reverse playback at the normal speed starts automatically, depending on the tape direciton.
To resume normal playback, press ▷.

To view the picture at double speed*
Select the playback direction with < /◀II or > /II▶, and then press x2 on the Commander.
–x2 or x2 appears in the viewfinder.
To resume normal playback, press ▷.

To view the picture frame-by-frame
In the still picture mode, press < /◀II or > /II▶. Each time you press, the picture appears by a frame.
II▶ on the camcorder is only for the forward direction. ◀II or II▶ appears in the viewfinder.
If you keep pressing ◀II/II▶, playback at 1/30 speed starts.
To resume normal playback, press ▷.

To locate the desired scene (picture search)
Keep pressing ◀◀ or ▶▶ during playback or in the still picture mode. ◀◀ or ▶▶ appears in the viewfinder.
To resume normal playback, release the button.

To locate the desired scene quickly (skip scan)
Press ◀◀ during rewinding or ▶▶ during advancing the tape rapidly. ◀◀ or ▶▶ appears in the viewfinder.
To resume normal playback, press ▷.

* Only on the Commander.

About the playback picture
During the various playback modes except the still picture and slow playback, streaks appear.

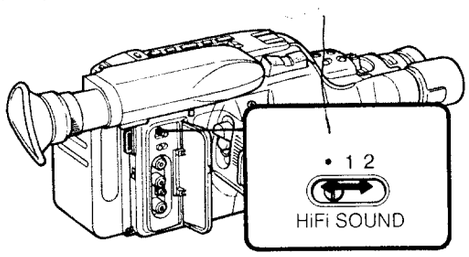
About the sound during playback in the various playback mode
The sound can be heard during playback at double speed in forward direction, but it is a little noisy.

Note on still picture
When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

If the still picture, frame-by-frame picture, or slow playback picture is noisy
Set the camcoder into the slow playback mode, and press "+" or "–" side of EDITSEARCH on the camcorder until the least noisy picture appears.

If the still picture shakes
Press "+" or "–" side of EDITSEARCH on the camcorder until the most stable picture appears.

(T-3)



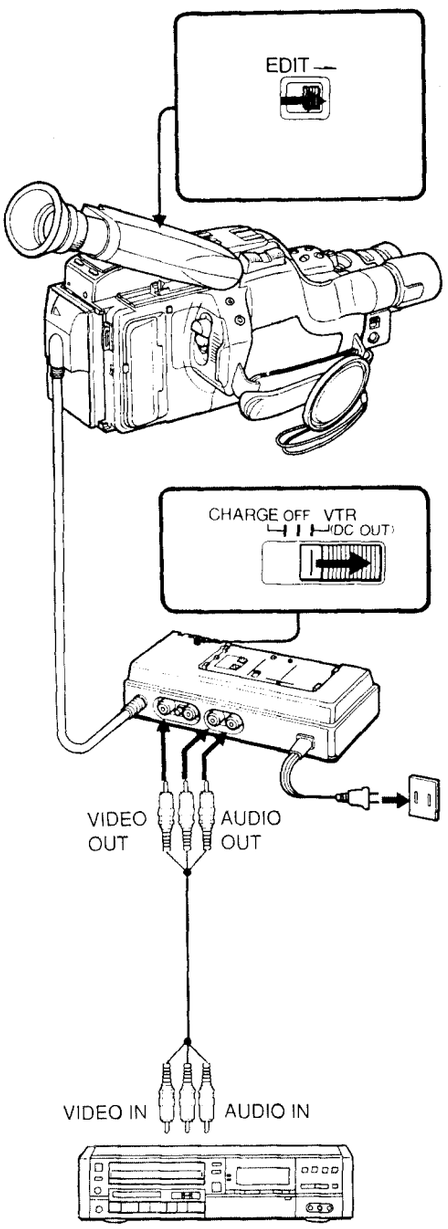
Playing Back the Dual Sound Recorded Tape

(T-3)
Normally set HiFi SOUND to ● position.
When the dual sound recorded tape is played back, set HiFi SOUND to the desired sound, 1 or 2.

Note
When you connect the TV using the RFU adaptor, or when the TV or VCR is a monaural type, set HiFi SOUND to ● position.

Editing onto Another VCR

(U)



You can create your own video program by editing with any other 8-mm, Betamax or VHS format VCR. Also you can superimpose and record the titles.

Before you begin
(U)

- Make connections using the supplied A/V cable.
- Set the input selector of the VCR to LINE, if available.
- Set EDIT on the camcorder to the direction of the arrow.

Operation

1 Insert a tape to be recorded on into the recording VCR.
2 Set POWER of the camcorder to VTR and insert your recorded tape.
3 Play back on the camcorder and locate the point where you wish to start editing and set the camcorder to the playback pause mode.
4 On the recording VCR, locate the recording starting point and set the VCR to the recording pause mode.
5 Press **II** of both VCRs simultaneously to start editing.

To stop editing momentarily, press **II** on the recording VCR.
To edit more scenes, repeat steps 3 to 5.
To stop editing, press □ on both VCRs.

If your VCR is a monaural type
Connect it referring to (S-4) in page 51.

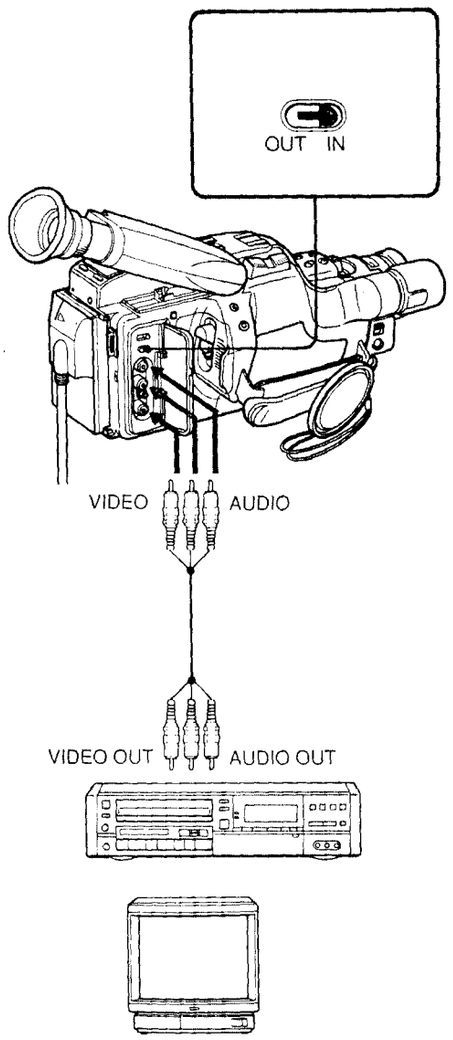
To record a title
You can superimpose and record the titles on the picture while editing.
For details, refer to page 43 to 46.

If you use the DATA SCREEN function
The indications displayed on the TV screen will also be recorded.

Use of the EDIT switch
When you set EDIT to the direction of the arrow (EDIT ON), the quality of the edited tape will have a certain extent of degration in picture and sound. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arow (EDIT OFF).

Recording from a TV or Another VCR

(V)



You can record a TV program from the TV or a tape from another VCR equipped with audio/video outputs.

Before you begin (V)

- **Set the IN/OUT selector on the camcorder to IN.**
- Make connections using the supplied A/V cable.
- **Disconnect the RFU adaptor from the AC power adaptor,** if it is connected.

Operation

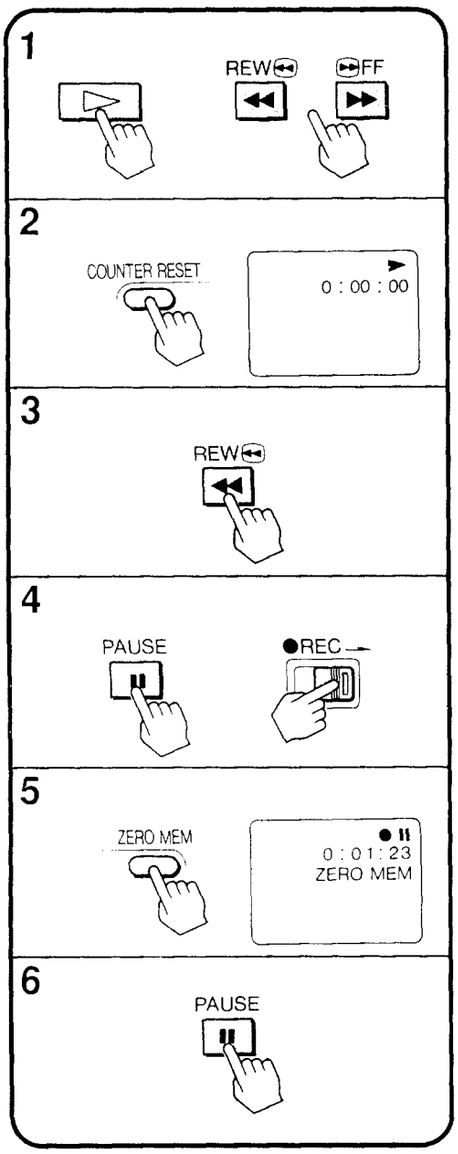
1 Turn on the TV or VCR.
2 Select the TV channel or play back the tape to be recorded.
3 Set the POWER of the camcorder to VTR.
4 Insert a tape and slide ● REC.
Recording will start.
You can monitor the picture being recorded in the viewfinder screen.

If your equipment is a monaural type

1 Connect the yellow pin to VIDEO and the white pin to AUDIO L of the camcorder.
2 Connect the yellow and white pins to AUDIO/VIDEO OUT of the VCR or TV.

Insert Recording

(W)



You can insert a new scene from a VCR or the TV onto your originally recorded tape (W)

Before you begin

- Connection is the same as in "Recording from a TV or Another VCR".
- Set the VCR in the playback pause mode at the beginning of the scene to be recorded.
- Set the POWER of the camcorder to VTR and display the counter in the viewfinder or display window.

Operation

1 **Locate the end point where the insert should end by pressing ◀◀ or ▶▶ during playback.**

2 **At the end point, press COUNTER RESET.**
The counter is reset to "0:00:00".

3 **Locate the start point where the insert should begin.**

4 **At the start point, set the camcorder into recording pause mode.**

5 **Press ZERO MEM.**
The end point of the insert is stored in memory.

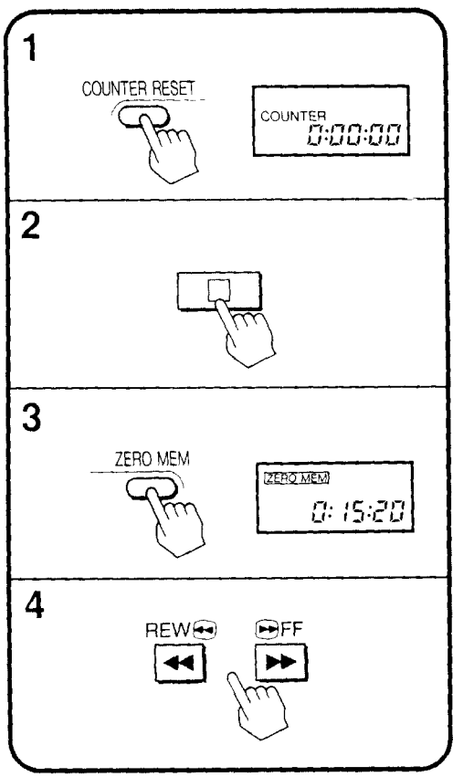
6 **Press II of both units to start insert recording.**
You can monitor the picture being inserted in the viewfinder screen.

The insert recording will stop automatically near the zero point on the counter.

To change the end point
Press ZERO MEM so that the ZERO MEM indicator disappears, and operate again from step 1.

Using the Tape Counter

(X)



During recording or playback, the digits on the counter indicate the actual recording or playback time.

To Index the Whole Tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00". Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

To Return to a Pre-registered Point

(X)

1 **During recording or playback, press COUNTER RESET at the point you later want to locate.**
The counter shows "0:00:00".

2 **Press □ when the recording or playback has finished, as usual.**

3 **Press ZERO MEM.**
The "ZERO MEM" indicator blinks in the display window.

4 **Press ◀◀ or ▶▶.**
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

Notes on the tape counter and ZERO MEM button

- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.
- Be sure to press ZERO MEM after you stop the tape. It does not function during recording or playback.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to the point where you pre-registered.

Hints for Better Shooting

(Y-1)

Getting Stable Pictures

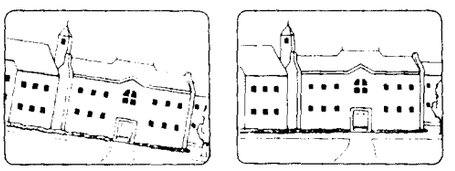
Take a good posture for shooting (Y-1)
For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip belt so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Stand opposite to the subject and let your feet take a comfortable stance.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod
If you have a tripod for a still camera, it can also be used with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

Keep the horizontal plane level (Y-2)
The horizontal plane can be easily determined by using the viewfinder frame as a reference.

(Y-2)



Planning Ahead

If you are going to edit the tape after recording
Shoot the scene a little longer to make the editing easier.

If you are not going to edit the tape after recording
First record a title and then use the START/STOP button to make a smooth recording.

Lighting

Shoot with the sun behind you

When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

Use video lights in the dark

To get the best colors, a sufficient light level must be maintained.

Photography lamps or halogen lamps are recommended. For best results, use of Sony video lights are recommended since their weight and low heat output levels allow safe, direct connection to the camcorder.

Do not point the light at the camcorder. The high heat from the light can warp the casing of the camcorder.

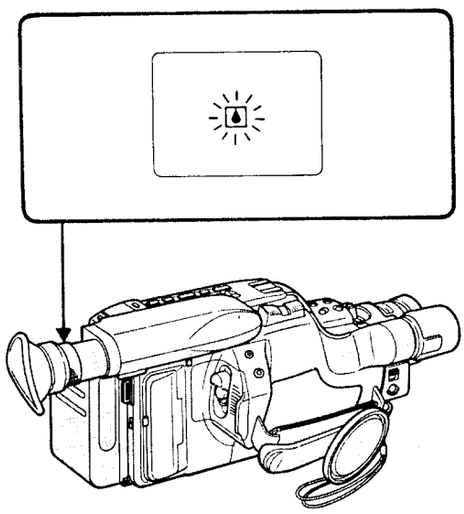
For detailed instructions on proper use of the light, read its instruction manual.

Brightness levels

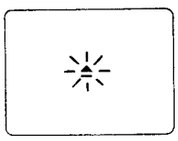
Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording technique.

Situation	Brightness	Condition
Snow-covered mountains Snow fields Sandy beach, clear day in summer	Unit: lux	ND filter recommended
Clear day, mid day (100,000 lux) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)	100,000	Normal recording
Overcast day, one hour after sunrise (2,000) Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) Department store counter (500 – 700) Station wicket (650) Office lit by fluorescent lamps (400 – 500) Room lit by two 30 W fluorescent lamps (300) Subway station platform (300)	10,000 1,000 500 300	
Arcade at night (150 – 200)	100	Video light recommended
Theater lobby (15 – 35) Candlelight (10 – 15)	10	

(Z-1)



(Z-2)



Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the comcorder is furnished with moisture sensors. However, take the following precautions.

If moisture condenses inside the unit

(Z-1)
Moisture is present inside the camcorder when the 💧 indication in the viewfinder blinks.
In such cases, no function except for tape ejection will work.
Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least 1 hour.
The camcorder can be used again if the 💧 indication does not appear when the power is turned on again.

If moisture condenses on the surface of the tape

(Z-2)
If moisture is present on the surface of the tape when the tape is inserted and a tape transport button (▷, ◀◀, etc.) is pressed, the ⏏ indication blinks inside the viewfinder.
In such case, no function except for tape ejection works.
Eject the tape and let the camcorder and the tape sit for at least 1 hour.
The tape can be used again if the ⏏ indication does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No caution indications will appear, but the picture becomes dim.
Turn off the power and leave the camcorder unused for at least 1 hour.

(Z-3)

Notes on Video Head Cleaning

(Z-3)

To ensure clear picture, clean the video heads periodically.

When playback pictures are noisy or hardly visible, the video heads may be contaminated.

[a] Slight contamination

[b] Critical contamination

In such case,

1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.

2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.

3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor), or 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it because heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- Do not put the camcorder on the sand.

On care

- When the unit will not be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
  Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Note on copyright
Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Using Your Camcorder Abroad

Each country has its own electricity system and TV color system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Difference in Color System

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be a NTSC system based TV. Check the following list (in alphabetical order).

NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, The Philippines, U.S.A., etc.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, West Germany, etc.

SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, The Soviet Union, etc.

Specifications

System

Video recording system
Rotary two heads, Helical scanning FM system
Audio recording system
Rotary head, FM system
Video signal NTSC color, EIA standards
Usable cassette 8 mm video format cassette
Tape speed SP: Approx. 1.43 cm (9/16 inch)/sec.
LP: Approx. 0.72 cm (5/16 inch)/sec.
(playback only)
Recording time SP mode: 2 hours (P6-120)
Playback time SP mode: 2 hours (P6-120)
LP mode: 4 hours (P6-120)
Fast forward/rewind time
Approx. 6 min. 30 sec. (P6-120)
Image device CCD (Charge Coupled Device)
Viewfinder Electronic viewfinder (black and white)
Lens Combined 8 x power zoom lens
f=8.5 to 68 mm, F 1.6 with macro
Filter diameter: 46 mm (1 13/16 inches)
Auto focus system TTL
Color temperature AUTO, HOLD
▲ (indoor) 3,200 K
• (outdoor) 5,800 K
Minimum illumination
2 lux
Illumination range 2 lux to 100,000 lux
(0.2 to 9294 footcandles)
Recommended illumination
More than 100 lux
(9 footcandles)
Aperture correction Automatic

Input and output connector

Video input/output Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio input/output Phono jack (L, R).
Input: -7.5 dBs, input impedance more than 47 kilohms
Output: -7.5 dBs, (at output impedance 47 kilohms) impedance less than 1 kilohms
RFU DC OUT Special minijack, DC 5 V
Headphone jack Minijack, 8-ohm impedance
Remote jack Stereo mini-minijack
MIC jack Stereo minijack, -66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kiohms
Microphone power output jack
Special minjack, 5 V DC

General

Power requirements
On battery mounting surface
6.0 V (battery pack)
7.5 V (AC power adaptor)
9.0 V (alkaline batteries)
Power consumption
6.9 W (camera recording) including the viewfinder
Installation Vertically, horizontally
Operating temperature
0°C to 40°C (32°F to 104°F)
Storage temperature
-20°C to +60°C (-4°F to +140°F)
Dimensions Approx. 111 x 139 x 321 mm (w/h/d) (4 3/8 x 5 1/2 x 12 3/4 in.)
Weight Approx. 1.2 kg (2 lb 10 oz) excluding the battery and cassette
Microphone Electret condenser microphone, stereo type

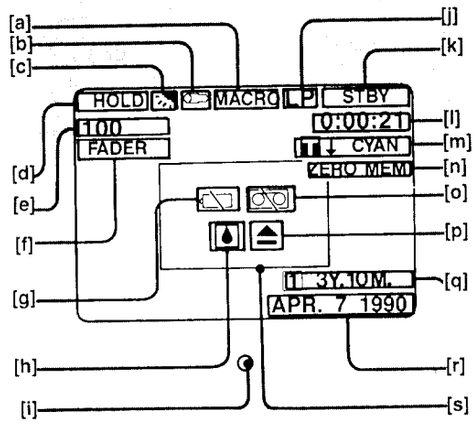
Wireless Remote Commander

Remote control system
Infrared control
Command mode VTR 2
Power requirements
3 V DC, 2 size AA (R6) batteries
Dimensions Approx. 57 × 20 × 120 mm (w/h/d) (2 1/4 × 13/16 × 4 1/4 inches)
Weight Approx. 62 g (2 oz) (excluding batteries)

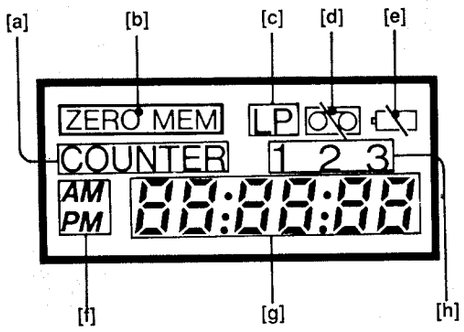
Design and specifications are subject to change without notice.

Indications Inside the Viewfinder and the Display Window

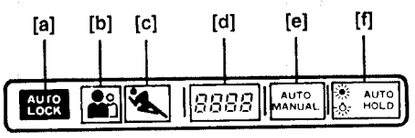
(AA)



(BB)



(CC)



Inside the Viewfinder

(AA)

[a] MACRO AF is pressed. (MACRO)
[b] WIND is selected. ( )
[c] BACK LIGHT is pressed. ( )
[d] White balance mode. (, , HOLD)
[e] PROGRAM AE setting (,) or Shutter speed
[f] FADER is pressed.
[g] "Exchange battery." ( )
[h] Moisture has condensed. ( )
[i] Shows up during recording.
When blinking: "Exchange battery or tape."
[j] Playback mode (LP)
[k] Tape transport mode
[l] Tape counter
[m] Title mode and color
[n] ZERO MEM is pressed.
[o] "Exchange tape or no tape inside." ( )
[p] "Trouble has occurred" ( ) or "Clean video heads." ( )
[q] Age
[r] Date or time
[s] Autofocus zone

In the Display Window

(BB)

[a] Appears in counter mode
[b] ZERO MEM is pressed.
[c] Tape speed is LP mode.
[d] "Exchange the tape or no tape inside."
[e] "Exchange the battery."
[f] AM/PM indication
[g] Counter, or time/date/age indication
Time, date or age is displayed when you press the respective button.
To return to the counter, press the button of the current indication, and check that time/date/age is not displayed in the viewfinder.
[h] Age/event memory number

(CC)

[a] Appears in automatic adjustment mode
[b] Appears in portrait mode
[c] Appears in sports mode
[d] Shutter speed
[e] Focus mode
[f] White balance mode

Trouble Check

If any difficulty should arise during operation, go through the following table. Should the difficulty persist, unplug the unit and contact your Sony dealer or local authorized Sony service facility.

Symptom	Cause	Corrective actions
The power does not turn on.	The battery is not attached.	Attach the battery.
	The battery is used up.	Use a charged battery.
	The AC power adaptor is not connected to a wall outlet.	Connect the adaptor to a wall outlet.
The power turns off.	While being operated in the CAMERA mode, the camcorder has been in the pause mode for more than 5 minutes.	Slide down the STANDBY switch, and slide it up again.
	The battery is used up.	Use a charged battery.
The battery pack is quickly discharged.	The ambient temperature is too low.	—
	The battery pack has not been charged fully.	Charge the battery pack again.
The START/STOP button does not operate.	The tape is affixed to the drum.	Remove the tape with the cassette eject button.
	The tape is at its end.	Rewind the tape or use a new one.
	The POWER switch is set to VTR.	Set it to CAMERA.
	The tab on the tape is out (red).	Use a new tape or slide the tab.
The tape cannot be removed from the compartment.	The battery is used up.	Use a charged battery or the AC power adaptor.
No function except for tape ejection works.	Moisture condensation has occurred. (See page 61.)	Remove the tape and leave the camcorder for at least an hour.
The tape does not move when a tape transport button is pressed.	The POWER switch is set to CAMERA or OFF.	Set it to VTR.
	The tape is at its end.	Rewind the tape or use a new one.
The auto focusing function does not work.	AUTO LOCK was not set to the green position when recording.	Set AUTO LOCK to the green position.
	Shooting conditions are not suitable for autofocusing operation. (See page 32).	Set AUTO LOCK to the lower position and press FOCUS to adjust the focus manually.
The image on the viewfinder screen is not clear.	The viewfinder lens is not adjusted.	Adjust the viewfinder lens.
A vertical band appears when a subject such as lights or a candle flame is shot against a dark background.	The contrast between the subject and background is too high; the camera is not malfunctioning.	—
The color of the playback is not appropriate.	AUTO LOCK was not set to the green position when recording.	—
	Shooting conditions are not suitable for auto white balance operation. (See page 34.)	Set AUTO LOCK to the lower position and press WHT BAL to adjust the white balance manually.
The playback picture is not clear.	EDIT is set in the direction of the arrow.	Set EDIT in the reversed direction of the arrow.
	The channel or input for the camcorder is not selected on the TV.	Correctly select.
The picture is noisy.	The video heads may be contaminated.	Clean the heads using the Sony V8-25CLH (See page 62.) cleaning cassette.
When the TV is connected to the camcorder using the VIDEO/AUDIO jacks, the picture on the TV is not clear or moves vertically.	The IN/OUT selector is set to OUT.	Set it to IN.

If an indication blinks in the viewfinder screen or a caution lamp on the main unit blinks, check the following table.

[ ] slow blinking [ ] fast blinking

	Symptom	Cause	Corrective actions
Camera operation VTR operation		The battery is weak.	Prepare a charged one.
	Battery lamp		
		The battery is used up.	Use a charged battery.
	Battery lamp		
Camera operation	⏏	The tape is at its end.	Use a new tape.
	Battery lamp		
		The tape is near its end.	Prepare a new one.
	Battery lamp		
		No tape is inserted.	Insert a tape.
	⏏	The tab on the tape is out (red).	Slide the tab.
Camera operation VTR operation	or ⏏	Moisture condensation has occurred.	Remove the tape and leave the camcorder for at least an hour.
	⊗	The gap of the head is clogged.	Clean the head using the Sony V8-25CLH video head cleaning tape.
	Caution lamp		
	⏏	Other troubles may occur.	Consult your nearest Sony dealer.
	Caution lamp		
	"AM12:00:00" blinks for 5 seconds in the viewfinder after setting the POWER switch to CAMERA.	The lithium battery is not installed. The lithium battery is exhausted.	Install the lithium battery.
	In the display window "AM12:00:00" or bars indication blinks.		
	The current time blinks for 5 seconds in the viewfinder after setting the POWER switch to CAMERA.	The lithium battery is weak.	Use a new battery.
	In the display window, the counter, date/time indication blinks.		